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KOGANEI

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DIN EN ISO 9001
JIS Z 9901
Certificate: 09 100 5919

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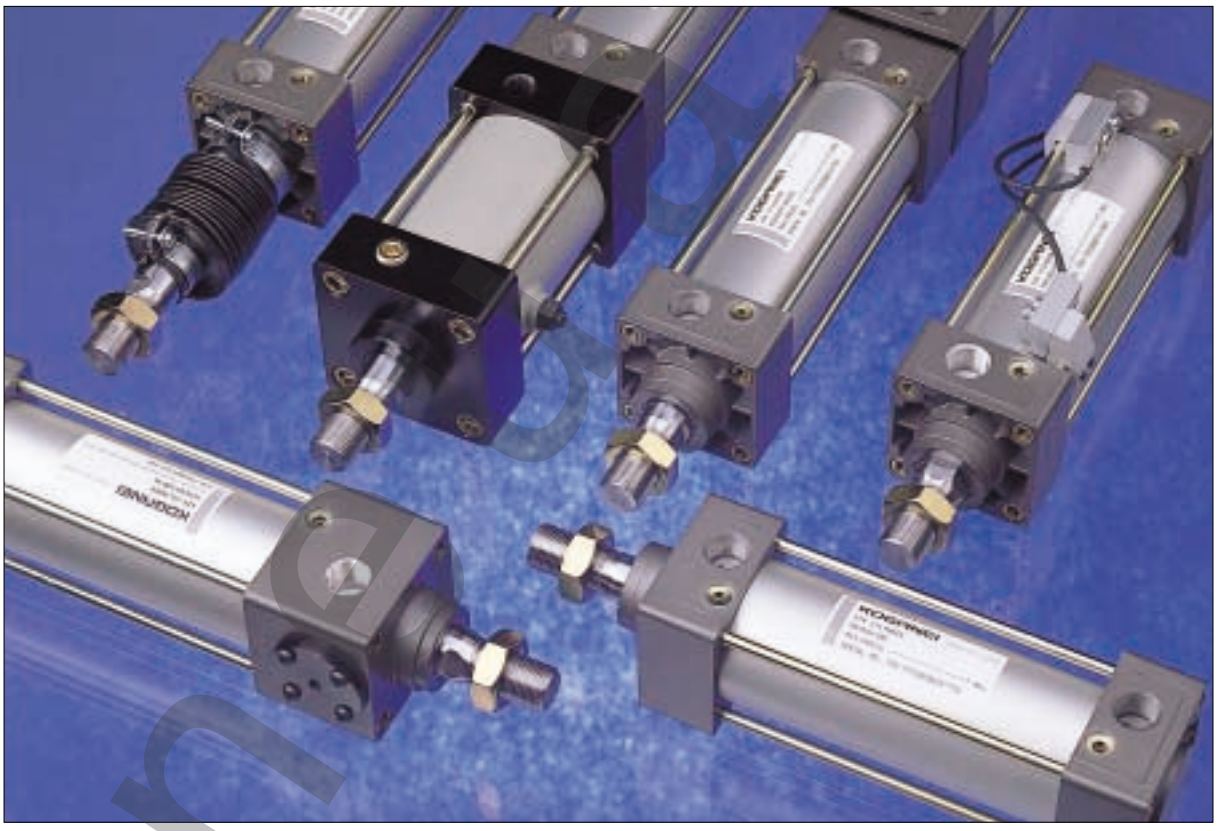
NEW DYNA CYLINDERS



NEW Products

From Non-rotating cylinder to cylinder with brake

Wide Product Range

preliminary

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NEW DYNA Cylinder

Highly reliable design of with ISO standards.

The NEW DYNA cylinders, compact and lightweight mid-sized actuators compatible with ISO standards, offers a wide range of configurations and mounting types to meet various application requirements with a flexible manner. Moreover, the use of a new type cushion needle and floating packing etc have made the product user-friendlier.

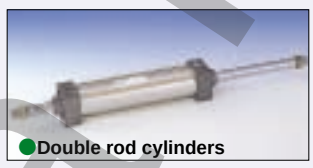
⚠ Caution Before use, always read the Safety Precautions on p. 3.

Light & Compact
preliare

Variation

● Standard cylinders

● Non-rotating cylinders


● Double rod cylinders

● Non-rotating double rod cylinders

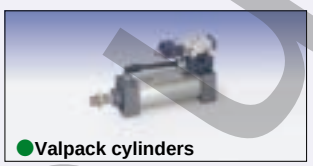
● Tandem cylinders

● Dual stroke cylinders

● Push side stroke adjusting cylinders

● Pull side stroke adjusting cylinders

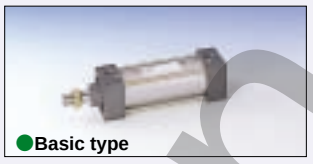
● Low hydraulic cylinders


● Valpack cylinders

● End keep cylinders

● Cylinders with brake

Mounting type


● Basic type

● Foot mounting type

● Axis right angled foot mounting type

● Rod side flange mounting type

● Head side flange mounting type

● Clevis mounting type with supporting bracket

● Pivot mounting type

● Trunnion type with supporting bracket

Accessory

● Sensor switches

● Knuckles

● Cylinder with bellows

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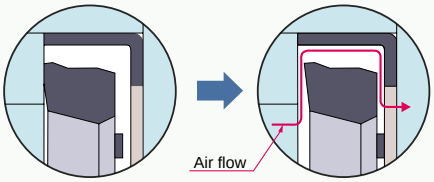
compact tie-rod type body mid-sized cylinder compatible

1 Extensive variation of functions

■ The series configuration together with its combined wider functions and specifications offer the best match for various mechanical devices.

2 Improved cushioning characteristics

■ Improved cushioning characteristics are gained by utilising floating packing in the cushion section.

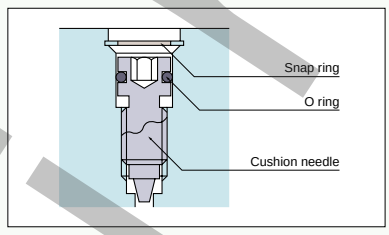


3 Long life

■ By using oil-permeated sintered copper alloy for the bushing enables stable operation and longer life.

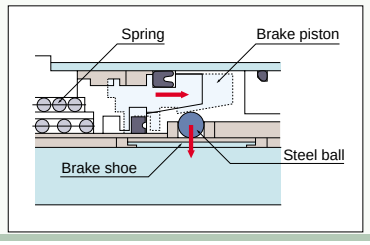
4 New type cushion needle

■ Using a new type of cushion needle that is completely embedded in the cylinder body offers fine adjustment leading to increased performance.



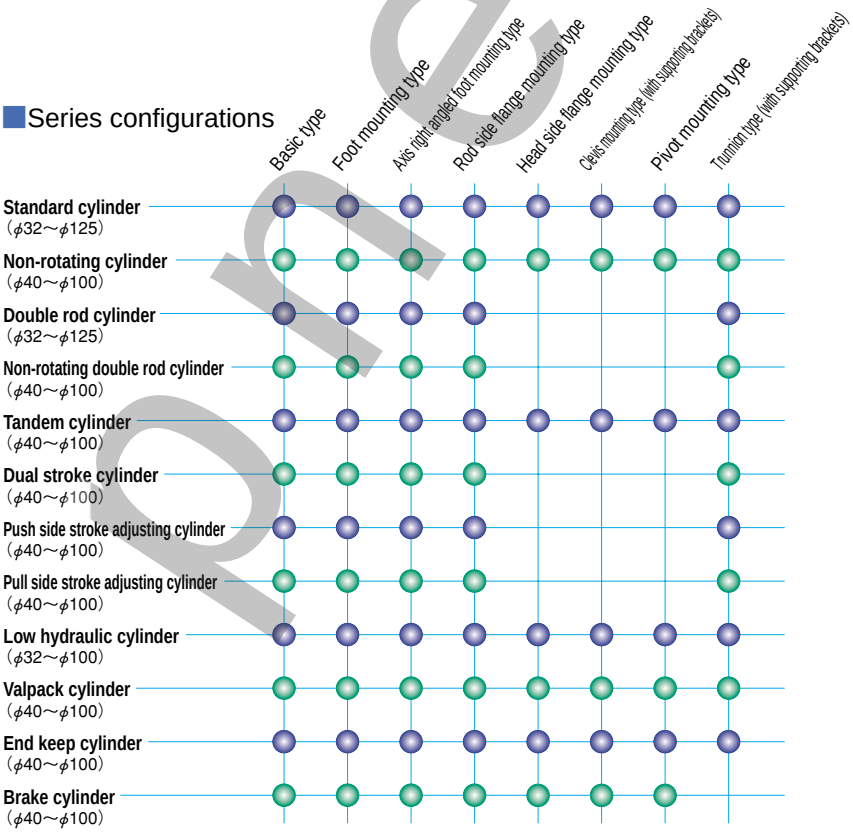
5 Safe self-lock mechanism

■ New release of brake cylinder range. Exhaustion of compressed air activates a brake shoes onto the piston rod there by stopping the cylinder.



※Steel balls and a brake shoe are fixed in position. By operating the brake piston enables activation or release of the brake.

■Series configurations


Basic type
Foot mounting type
Axis right angled foot mounting type
Rod side flange mounting type
Head side flange mounting type
Clevis mounting type (with supporting brackets)
Pivot mounting type
Trunnion type (with supporting brackets)
Standard cylinder (ϕ32~ϕ125)
Non-rotating cylinder (ϕ40~ϕ100)
Double rod cylinder (ϕ32~ϕ125)
Non-rotating double rod cylinder (ϕ40~ϕ100)
Tandem cylinder (ϕ40~ϕ100)
Dual stroke cylinder (ϕ40~ϕ100)
Push side stroke adjusting cylinder (ϕ40~ϕ100)
Pull side stroke adjusting cylinder (ϕ40~ϕ100)
Low hydraulic cylinder (ϕ32~ϕ100)
Valpack cylinder (ϕ40~ϕ100)
End keep cylinder (ϕ40~ϕ100)
Brake cylinder (ϕ40~ϕ100)

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Safety Precautions (New DYNA Cylinders)

Always read these precautions carefully before use.

Before selecting and using products, please read all the Safety Precautions carefully to ensure proper product use.
The Safety Precautions shown below are to help you use the product safely and correctly, and to prevent injury or damage to assets beforehand.
Follow the Safety Precautions for: ISO4414 (Pneumatic fluid power—Recommendations for the application of equipment to transmission and control systems), JIS B 8370 (Pneumatic system regulations)

The directions are ranked according to degree of potential danger or damage: "DANGER!" "WARNING!" "CAUTION!" and "ATTENTION!"

⚠ **DANGER**	Expresses situations that can be clearly predicted as dangerous. If the noted danger is not avoided, it could result in death or serious injury. It could also result in damage or destruction of assets.
⚠ **WARNING**	Expresses situations that, while not immediately dangerous, could become dangerous. If the noted danger is not avoided, it could result in death or serious injury. It could also result in damage or destruction of assets.
⚠ **CAUTION**	Expresses situations that, while not immediately dangerous, could become dangerous. If the noted danger is not avoided, it could result in light or semi-serious injury. It could also result in damage or destruction of assets.
⚠ **ATTENTION**	While there is little chance of injury, this content refers to points that should be observed for appropriate use of the product.

■This product was designed and manufactured as parts for use in General Industrial Machinery.

- ■ Before selecting the equipment and using any product, always read the Safety Precautions, the Catalog, the Instruction Manual, etc.
- ■ After reading the Instruction Manual, etc., always place the Manual where it can be easily available for reference to users of this product.
- ■ If transferring or lending the product to an another person, always attach the Instruction Manual, etc., to the product where it is easily visible, to ensure that the new user can use the product safely and properly.
- ■ The danger, warning, and caution items listed under these "Safety Precautions" do not cover all possible cases. Read the catalog and user's manual carefully, and always keep safety first.

⚠ DANGER

- ● Do not use for the purposes listed below:
  1. Medical equipment related to maintenance or management of human lives or bodies.
  2. Mechanical devices or equipment designed for the purpose of moving or transporting people.
  3. Critical safety components in mechanical devices.
     This product has not been planned or designed for purposes that require advanced stages of safety. It could cause injury to human life.
- ● Do not use in locations with or near dangerous substances such as flammable or ignitable substances. This product is not explosion prevention type. It could ignite or burst into flames.
- ● When attaching the product, always ensure that it is securely fixed in place. Dropping or falling the product or improper operation could result in injury.
- ● Persons who use a pacemaker, etc., should keep a distance of at least one meter away from the product. There is the possibility that the pacemaker will malfunction due to the strong magnet built into the product.
- ● Never attempt to rebuild the product. It could result in abnormal operation leading to injury, electric shock, fire, etc.
- ● Never attempt inappropriate disassembly or assembly of the product's basic configurations, or of its performance or functions. It could result in injury, electric shock, fire, etc.
- ● Do not splash water on the product. Spraying it with water, washing it, or using it underwater could result in malfunction of the product leading to injury, electric shock, fire, etc.
- ● While the product is in operation, avoid touching it with your hands or otherwise approaching too close. In addition, do not make any adjustments to the interior or to the attached mechanisms (removal, etc., of shock absorber, stroke adjustment mechanism, sensor switch mounting position, piping tubes, or sealing plugs) while in operation. The actuator can move suddenly, possibly resulting in injury.
- ● When operating the product, always install a speed controller, and gradually loosen the needle valve from a choked state to adjust the speed increasing. Failure to make this adjustment could result in sudden blasts of air, putting lives at risk.
- ● Do not apply loads to the piston rod that exceed its buckling or bending strength. It could reduce the product's working life, or cause abnormal wear or damage to the rod or tube.
- ● Always install the piston rod axial center and load so that their movement directions are aligned. A misalignment applies excessive force on the piston rod and tube that could lead to abnormal wear or to breakage.

⚠ WARNING

- ● Do not use this product in excess of its specification range. Such use could result in product breakdowns, function stop or damage.
- ● Before supplying air or electricity to the device and before starting operation, always conduct a safety check of the area of machine operation. Careless supply of air or electricity could possibly result in electric shocks, or in injury caused by contact with moving parts.
- ● Do not touch the terminal and the miscellaneous switches, etc., while the device is plugged in. There is the possibility of electric shock and abnormal operation.
- ● Do not allow the product to be thrown into fire. The product could explode and release toxic gases.
- ● Do not sit on the product, place your foot on it, or place other objects on it. Accidents such as falling and tripping over could result in injury. Dropping the product may damage or break the product resulting in abnormal, improper or erratic operation.
- ● When conducting any kind of operation for the product, such as inspection, repair, installation/removal of piping, or replacement, always turn off the air supply completely and confirm that residual pressure inside the product or in piping connected to the product is zero before proceeding. In particular, be aware that residual air will still be in the air compressor or air storage tank. The actuator could abruptly move if residual air pressure remains inside the piping, causing injury.
- ● Do not use the actuator for equipment whose purpose is absorbing the shocks and vibrations of mechanical devices. It could break and possibly result in injury or in damage to mechanical devices.

Online Manuals

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- Avoid scratching the cords for the sensor switch lead wires, etc. Letting the cords be subject to scratching, excessive bending, pulling, rolling up, or being placed under heavy objects or squeezed between two objects, may result in current leaks or defective transmission that lead to fires, electric shocks, or abnormal operation.
- Do not apply a lateral load of more than 1/20th of the cylinder thrust onto the cylinder rod bushing section. It could result in a shortened operating life, and in scratches or breakage of the rod or cylinder tube.
- Always use within the recommended load and specified speed. Use at levels exceeding the recommended loads or specified speeds could cause the piston rod or attaching plate to move suddenly, damaging the unit and causing injuries.
- Use safety circuits or system designs to prevent damage to machinery or injury to personnel when the machine shuts down due to an emergency stop or electrical power failure.
- Install relief valves, etc., to ensure that the actuator does not exceed its rated pressure when such pressure is increasing due to external forces on the actuator. Excessive pressure could lead to breakdown and damage.

⚠ CAUTION

- Do not use in locations under direct sunlight (ultraviolet), in locations subject to dust, salt, or iron powder, or in the media and/or the ambient atmospheres that include organic solvents, phosphoric ester-based hydraulic fluids, sulfur dioxide gas, chlorine gas and acids. These conditions could lead to functional shutdowns, sudden degraded performance, or shortened operating life in a brief period of time. For the materials used, see Major Parts and Materials.
- When mounting the product, leave room for adequate working space around it. Failure to assure adequate working space will make it more difficult to conduct daily inspections or maintenance, which could eventually lead to system shutdown or damage to the product.
- When transporting or installing heavy products, use a lift or support to firmly hold it up, or use a large number of people, and take full precautions to ensure personal safety.
- Do not bring floppy disks and magnetic media, etc., within one meter of the product. There is the possibility that the data on the floppy disks will be destroyed due to the magnetism of the magnet.
- Do not use the sensor switch in locations subject to large electrical currents or powerful magnetic fields. It could result in erratic operation. In addition, do not use magnetized materials in the mounting bracket. The magnetic force could be reduced, possibly resulting in erratic operation.
- Never use another company's sensor switch with these products. It could possibly cause error or accidental operation.
- Do not scratch, dent, or deform the actuator by climbing on the product, using it as scaffold, or placing objects on the top of it. It could result in damaged or broken products that result in operation shutdown or degraded performance.
- When performing mounting or adjustment work, put up "now working" signs to prevent applying unintentional air or electrical power, etc. Such applying accidental inputs may cause electrical shock, or sudden activation of the actuator that could result in physical injury.

⚠ ATTENTION

- When considering the possibility of using this product in situations or environments not specifically noted in the Catalog or user's Manual, or in applications where safety is an important requirement, such as in an airplane facility, combustion equipment, leisure equipment, safety equipment and other places where human life or assets may be greatly affected, take adequate safety precautions such as application with enough margins or fail-safe measures for ratings and performance. Please consult KOGANEI with any questions.
- Always check the catalog and other reference materials for product wiring and piping.
- Use a protective cover, etc., to ensure that human bodies do not come into direct contact with the operating space of mechanical devices, etc.
- Do not control in a way that would cause work to fall during power failure. Set the controls so that they prevent the table or work, etc., from falling during power failure or emergency stop of the mechanical devices.
- When handling the product, wear protective gloves, safety glasses, safety boots, etc., to assure safety.
- When the product can no longer be used, or is no longer necessary, dispose of it appropriately as industrial waste.
- Pneumatic equipment can exhibit degraded performance and function over its operating life. Always conduct daily inspections of the pneumatic equipment, and confirm that all requisite system functions are satisfied, to prevent accidents from happening.
- For inquiries about the product, contact your nearest Koganei sales office or Koganei overseas division. The address and telephone number is shown on the back cover of this catalog.

⚠ OTHER

- Always observe the following items.
  KOGANEI cannot be responsible if these items are not properly observed.
  1. When using this product in pneumatic systems, always use genuine KOGANEI parts or compatible parts (recommended parts).
     When conducting maintenance and repairs, always use genuine KOGANEI parts or compatible parts (recommended parts). Always observe the required methods.
  2. Do not attempt inappropriate disassembly or assembly of the product relating to basic configurations, or its performance or functions.

Preliminary

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Design and Selection

⚠ Warning

1. Check the specifications.
As use of this equipment over the specified ranges of voltage, current, temperature, shock, etc., could result in breakdown or abnormal operation, always read the specifications carefully to ensure correct use.

2. Avoid mounting cylinders in close proximity.
Mounting two or more cylinders with sensor switches in close proximity could result in erroneous operation of the sensor switch, due to magnetic field interference with the system.

3. Be cautious about sensor switch ON times for positioning detection at intermediate stroke position.
Be aware that if the sensor switch is mounted at an intermediate position of the cylinder stroke for detection of the piston travel, the sensor switch actuation time may be too short when the cylinder speed is very rapid, so that the load (sequencer, etc.) may fail to activate.
Maximum cylinder speed for positioning detection

$$V\text{〔mm／s〕} = \frac{\text{Sensor switch actuation range 〔mm〕}}{\text{Time required for activating load 〔ms〕}} \times 1000$$

4. Keep wiring as short as possible
In reed sensor switches, in particular, excessively long wiring (10m or more) can shorten the operating life of the sensor switch with capacitive surges. If the wiring must be lengthy, install the protection circuits for inductive or capacitive loads, as well.

5. Avoid repeated or excessive bending or pulling of lead wires.
Applying repeated bending stress or tension force on the lead wire could result in wire breaks.

6. Check for leak current.
Two-lead wire solid state sensor switches produce leak current to activate their internal circuits, and the current flows even when turned off. Check to ensure they satisfy the following formula.
Input-off current of programmable controller > Leak current
If the above formula cannot be satisfied, select a three-lead wire solid state sensor switch, instead. Also note that parallel connection of a total of n sensor switches will lead to n times the leak current.

⚠ Caution

1. Check for sensor switch internal voltage drop.
Series connection of reed sensor switches with indicator lamps or two-lead wire solid state sensor switches causes increasing internal voltage drop, and the load may fail to activate. A total of n sensor switches will lead to n times the internal voltage drop. Ensure that the system satisfies the following formula.
Supply voltage – Internal voltage drop × n > Minimum operating voltage for load
In relays with rated voltage of less than 24VDC, check to see whether the above formula is satisfied, even in the case of n = 1.
If the above formula cannot be satisfied, select either a reed sensor switch without indicator lamp, or a three-lead wire solid state sensor switch.

2. Do not use with other companies' cylinders.
The sensor switches are designed for use with Koganei cylinders. Use with other companies' cylinders could lead to abnormal operation.

3. Never use another company's sensor switch on these products.
It could result in erroneous or runaway operation.

Installation and Adjustment

⚠ Warning

1. Do not apply an external magnetic force to the sensor switch while the cylinder is in operation.
It could result in unintentional operation that could damage the unit or cause personal injury.

⚠ Caution

1. Ensure a safe environment for the sensor cylinder mounting.
Do not use sensor switches in places where a large current or magnetic fields are present. This could lead to unintentional operation. Do not use magnetic material for the mounting brackets. Magnetic force could leak out, resulting in erroneous operation.

2. Install sensor switches in the center of its operating range.
Adjust the mounting position of a sensor switch so that the piston stops in the center of its operating range (the range where the sensor turns on). Operations can be unstable if mounted at the end of the operating range (at the boundary near ON and OFF). Also be aware that the operating range can vary with changes in temperature.

3. Maintain the tightening torque of sensor switches when mounting.
Over-tightening beyond the allowed fastening torque may damage the mounting screws, mounting brackets, sensor switches, etc. In addition, insufficient tightening torque could cause the sensor switch position to change, resulting in operating instability.
For the tightening torque, see the Instruction for Detaching and Moving of Sensor Switch on p.103.

4. Do not use sensor switch lead wires to lift a cylinder.
After mounting a sensor switch to a cylinder, do not grab the lead wires to lift the cylinder. Never do this, as it could result in lead wire disconnections, and could also apply stress to the interior of the sensor switch, resulting in breakage of internal elements.

5. Do not drop switches, or bump them against others.
During handling of switches, do not apply excessive shocks (294.2m/s^2 {30G} or more) such as hitting, dropping, or bumping. In reed sensor switches, the contact reed can be activated unintentionally, causing it to send or break sudden signals. It can also cause changes in the contact interval that lead to changes in sensor switch sensitivity and result in erratic operation. Even if the sensor switch case is undamaged, the inner parts of the sensor switch may suffer breakdowns or cause erratic operation.

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Safety Precautions (Sensor Switch)

Wiring

⚠ Danger

1. Avoid letting moving objects near a sensor switch come into contact with it.
When cylinders with sensor switches move, or when moving objects are nearby, do not let the moving objects come into contact. In particular, lead wires could become worn out or damaged, inducing operating instability in the sensor switch. In the worst case, it could result in current leaks or electrical shocks.

2. Always turn off the power supply for wiring work.
Conducting wiring work while the power is on could result in electric shocks. Also, wiring errors could damage sensor switches in an instant. Turn on the power only after wiring work is complete.

⚠ Warning

1. Always check the Catalog, etc., to correctly conduct sensor switch wiring.
Mis-wiring could result in abnormal operations.

2. Do not share the same wiring with power or high voltage lines.
Avoid wiring in parallel to or shared with power or high voltage lines. The sensor switch or control circuit may suffer electric noise that results in erratic operation.

3. Avoid repeated or excessive bending or pulling of lead wires.
Applying repeated bending stress or tension force on the lead wire could result in wire breaks.

4. Check polarity in the wiring
In sensor switches that specify polarity (+, –, output), be sure that wiring connections are correct. The wrong polarity could result in damage to the sensor switch.

⚠ Caution

1. Avoid short circuiting the loads.
Turning a sensor switch on while the load is short-circuited causes overcurrent, which can damage the sensor switch in an instant. Example of short-circuited load: Sensor switch's output lead wire is directly connected to the power supply.

Handling Instructions, and Precautions

General Precautions

Media

1. Use air for media. Consult us for the use of any other media.
2. Air used for the cylinder should be clean air that contains no deteriorated compressor oil, etc. Install an air filter (filtration of 40 µm or less) near the cylinder or valve to remove drain contaminants or dust. In addition, drain the air filter periodically.

Piping

Always thoroughly flush out (blow with compressed air) the piping before connecting it to the cylinder. Entering metal chips, sealing tape, rust, etc., generated during plumbing could cause air leaks or other malfunctions.

Atmosphere

Install a cover, etc., or appropriate protective devices when operating in locations near excessive water, oil, etc., or large amounts of dust.

Lubrication

This equipment can be used without lubrication. If lubrication is used, it must be turbine oil Class 1(ISO VG32) or its equivalent. Avoid using spindle oil or machine oil.

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Handling

Assembly of mounting bracket

Use mounting screws which are supplied with the bracket to assemble the mounting bracket. Use a hexagonal bar wrench to tighten the mounting screws evenly. When four screws are used, tighten diagonally from each corner. The tightening torque is shown below.

Assembly and disassembly

For disassembly, insert a hexagonal bar wrench to loosen the tie rod nut, and remove the cover.
For assembly, screw in the tie rod nut with the hexagonal socket facing outward. Evenly tighten diagonally from each corner. The tightening torques are the values shown below.

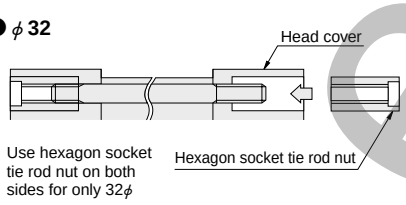
〈**Tightening torques of mounting brackets and tie rod nuts**〉

Bore size	Tightening torque
32・40・50	4.81N•m
63	12.0N•m
80・100	24.0N•m
125	42.2N•m

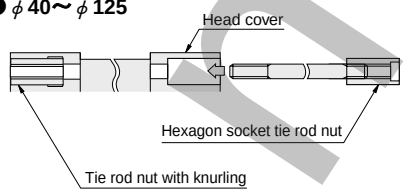
●**Width across flats of hexagonal socket** mm

Bore size	Tie rod nut	Mounting bracket
32	6	4
40・50	6	4
63	8	5
80・100	10	6
125	12	8

● **ϕ32**

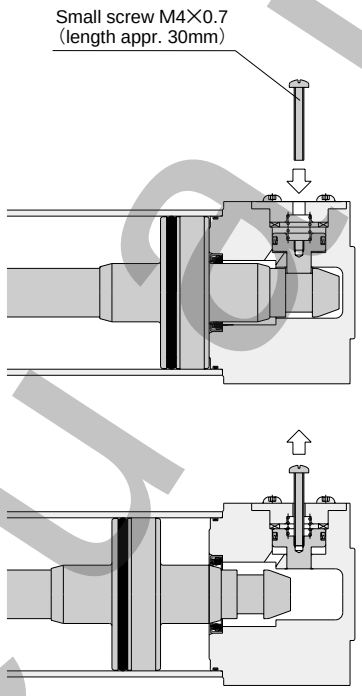


● **ϕ40～ϕ125**



Manual override of end keep cylinder locking mechanism

While the locking mechanism is normally released automatically through cylinder operations, it can also be released manually. For manual release, insert an M4×0.7 screw that is 30mm long from the neck into the manual override opening, thread it in about three turns into the internal lock piston, and then pull up the screw. To maintain a state of temporary release for adjustment, etc., pair the screw with a lock nut and, with the lock in a released state, tighten the lock nut against the cylinder side.



Cautions: 1. It is dangerous to release the lock when load (weight) is present on the piston rod because it may result in a sudden drop or cause the piston rod to extend (or retract). In this case, always supply air to a connection port on the side without the locking mechanism before releasing the locking mechanism.
2. If the locking mechanism cannot easily be released even with manual override, it could be the result of the lock piston and piston rod scuffing. In this case, supply air to a connection port on the side without the locking mechanism before releasing the locking mechanism.
3. Because water, oil, dust, etc., intruding through the manual override opening may be a cause of defective locks or other erratic operations, use a cover, etc., for protection when using in locations subject to dripping water, dripping oil, or to a large amount of dust, etc.
4. If the circuit cannot maintain exhaust pressure at 0.03MPa {0.3kgf/cm²} or less due to using a manifold valve, use individual valve for operations.

Control circuits for the end keep cylinder

1. For control of the DYNA end keep cylinder, we recommend the use of 2-position, 4-,5-port valves. Avoid the use of 3-position valves in ABR connections (exhaust centers) or other control circuits that exhaust air from both ports.
2. Always use meter-out control for speed control. Meter-in control may result in failure of the locking mechanism to release.
3. Always set the air pressure to 0.15MPa {1.5kgf/cm²} or more.

Cautions: 1. It is dangerous to supply air to a connection port on a side with a locking mechanism while the cylinder has already exhausted, because the piston rod may suddenly extend (or retract). In addition, since the lock piston could scuff the piston rod, perhaps resulting in abnormal operation, always supply air to the connection port on the opposite side to ensure applying back pressure.
2. When restarting operations after air has been exhausted from the cylinder due to completion of operations or to an emergency stop, always start by supplying air to a connection port on the side without a locking mechanism.
3. Connect valve port A (NC) to a connection port on the side with a locking mechanism.

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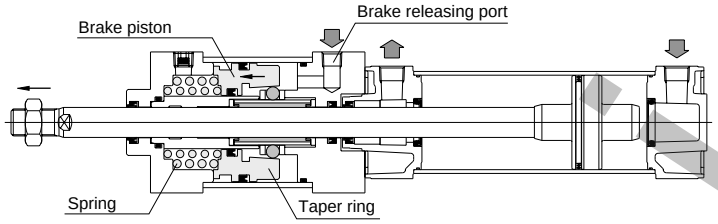
Installation and piping (cylinder with brake)

Operating principle

The cylinder with brake uses a mechanism that consists of steel balls contacting a slope and it receives components of a spring force, then it transmits the force via a brake shoe to apply to the piston rod.

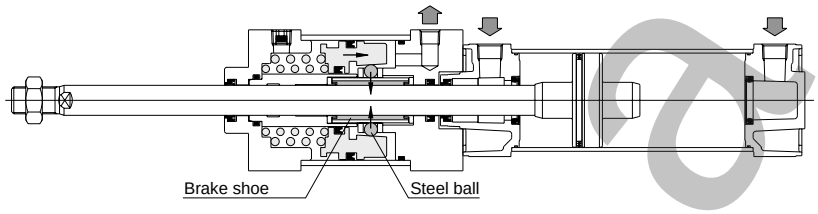
●When the brake is released



When the brake is released

A supply of compressed air from the brake releasing port causes the brake piston including the taper ring to retract and frees the steel balls contact from the taper ring, which releases the brake and lets the piston rod freely slide.

●When the brake is activated



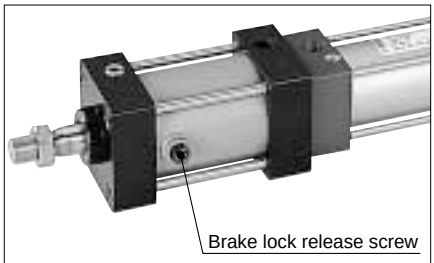
When the brake is activated

Exhausting compressed air from the brake releasing port causes the spring to press against the brake piston, transmitting component of a spring force via the taper ring to the steel balls, which then works via the brake shoe to transmit a perpendicular force to the piston rod and to apply friction force to the brake.

Precautions during installation

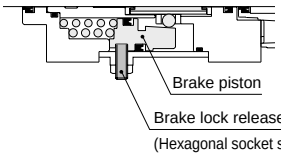
1. In the cylinder with brake, the brake piston in the single brake type is fixed in place with two hexagon socket set screws, and in the double brake type with four such screws, with the brake set in a released state at time of delivery.
When piping and installation is completed, or when performing operation checks, firstly supply air at least 0.35MPa (0.4MPa for an inner diameter of ϕ50) from the brake release port, and remove the set screws. Then, by exhausting off the compressed air enables to hold the piston rod. While the unit could be operated with the set screws removed, it is better for prevention of entering dust to use two set screws with nuts to fix it in place by inserting 2 or 3 ridges into the cylinder.
At this time, do not tighten the set screws too excessive as it could interfere with brake piston, by re-locking it in place, or by constricting its movements.

2. Poor centering of the cylinder with brake may damage the seal or hasten wear on the brake shoe.
As poor centering could also result in variation of the stopping position, use of a cylinder joint is recommended.



Single brake : 2 locations
Double brake: 4 locations

During use, loosen the brake lock release screw, and set so that it does not bump against the brake piston.



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Installation and piping (cylinder with brake)

Control circuit

Electric control

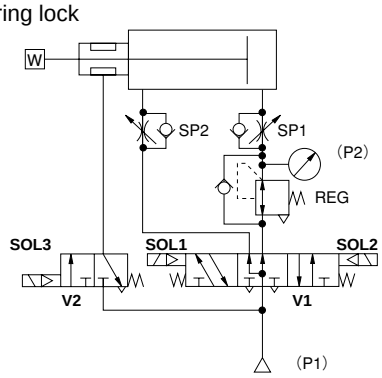
If using a sequencer for control, the sequencer scan time will result in stop position errors. To improve the stopping positioning accuracy, use signals from the cylinder's sensor switch and use direct control via a TTL circuit, etc., for switching valves.

Pneumatic circuit

1. To ensure balance with the load, and balance with the difference in rod diameter sizes, always use a regulator with check valve.
2. Use a PAB connection 3-position solenoid valve, etc., as the cylinder operating solenoid valve (V1).
3. Mount a solenoid valve for brake (V2) as closely as possible to the cylinder, while use of a DC current solenoid valve will improve response (stopping position accuracy).

Example of standard circuit (Reference)

●Horizontal mounting
Spring lock

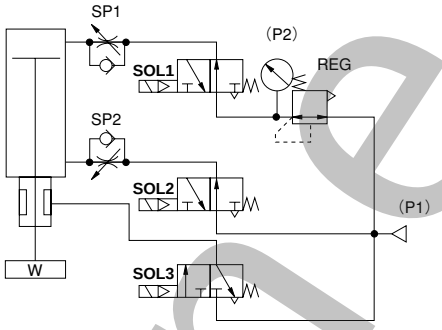


Regulator pressure setting

$$P2 = \frac{D^2 - d^2}{D^2} \cdot P1$$

D : Cylinder bore size (mm)
d : Rod diameter (mm)
P1: Supply pressure (MPa)

●Vertical mounting
Spring lock

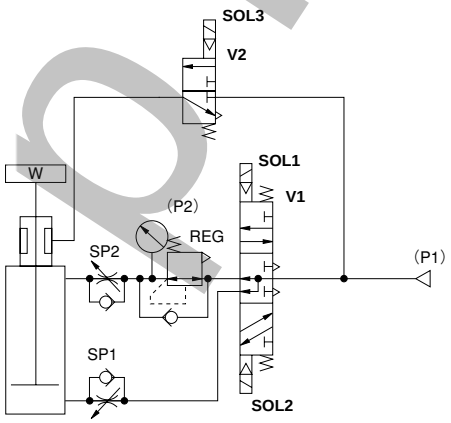


Regulator pressure setting

$$P2 = \frac{\pi (D^2 - d^2)\, P1 - 4W}{\pi \cdot D^2}$$

D : Cylinder bore size (mm)
d : Rod diameter (mm)
P1: Supply pressure (MPa)
W: Load (N)

●Vertical mounting (thrust up)



Regulator pressure setting

$$P2 = \frac{\pi \cdot D^2 \cdot P1 - 4W}{\pi (D^2 - d^2)}$$

D : Cylinder bore size (mm)
d : Rod diameter (mm)
P1: Supply pressure (MPa)
W: Load (N)

ON, OFF switch sequence for solenoid
(same for all mounting positions)

Valve / Operating state	V1		V2
	SOL1	SOL2	SOL3
Intermediate stop	OFF	OFF	OFF
Forward	OFF	ON	ON
Reverse	ON	OFF	ON

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Air Flow Rate, Air Consumption

While the air cylinder's air flow rate and air consumption can be found through the following calculation, the quick reference chart at right provides the answers more conveniently.

Air flow rate $Q_1 = \frac{\pi D^2}{4} \times L \times \frac{60}{t} \times \frac{P+0.1013}{0.1013} \times 10^{-6}$

Air consumption $Q_2 = \frac{\pi D^2}{4} \times L \times 2 \times n \times \frac{P+0.1013}{0.1013} \times 10^{-6}$

Q_1	: Necessary air flow rate for cylinder	ℓ/min(ANR)
Q_2	: Air consumption of cylinder	ℓ/min(ANR)
D	: Cylinder bore	mm
L	: Cylinder stroke	mm
t	: Time necessary that cylinder travels one stroke	s
n	: Number of cylinder reciprocations per minute	times/min
p	: Pressure	MPa

Air consumption for every 1mm stroke — cm³/Reciprocation (ANR)

Bore size mm	Air pressure MPa								
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
32	3.20	4.78	6.37	7.96	9.55	11.14	12.72	14.31	15.90
40	4.99	7.48	9.96	12.44	14.92	17.40	19.88	22.36	24.84
50	7.80	11.68	15.56	19.43	23.31	27.19	31.06	34.93	38.78
63	12.39	18.54	24.70	30.85	37.01	43.16	49.32	55.46	61.57
80	19.98	29.90	39.83	49.75	59.67	69.60	79.52	89.45	99.37
100	31.21	46.72	62.23	77.73	93.24	108.75	124.25	139.76	155.27
125	48.77	73.00	97.23	121.46	145.69	169.92	194.14	218.37	242.60

The figures in the table are for calculating the air flow rate and air consumption during one reciprocation of an air cylinder with stroke of 1mm. The actual air flow and consumption required can be found through the following method.

●Finding the air flow rate (for selecting F.R.L., valves, etc.)

Example When operating an air cylinder with bore size of 40mm at speed of 300mm/s and under air pressure of 0.5MPa

$14.92 \times \frac{1}{2} \times 300 \times 10^{-3} \fallingdotseq 2.21$ ℓ/s (ANR)

(At this time, the air flow per minute becomes $14.92 \times \frac{1}{2} \times 300 \times 60 \times 10^{-3} =$ 134.28 ℓ/min (ANR))

●Finding the air consumption

Example 1. When operating an air cylinder with bore size of 40mm and stroke of 100mm, and under air pressure of 0.5MPa, for 1 reciprocation

$14.92 \times 100 \times 10^{-3} = 1.492$ ℓ/Reciprocation (ANR)

Example 2. When operating an air cylinder with bore size of 40mm and stroke of 100mm, and under air pressure of 0.5MPa, for 10 reciprocations per minute

$14.92 \times 100 \times 10 \times 10^{-3} = 14.92$ ℓ/min (ANR)

Cylinder Thrust

Find the required thrust for a given load and air pressure, and select the appropriate cylinder bore size.

Since the figures in the table are calculated values, select the bore size so that the load ratio (load ratio = $\frac{\text{Load}}{\text{Calculation value}}$) becomes 70% or less (50% or less for high speeds).

N

Bore size mm	Rod diameter mm	Operation	Pressure area mm²	Air pressure MPa									
				0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
32	**12**	Push side	804	80	61	241	322	402	482	563	643	724	804
		Pull side	690	69	138	207	276	345	414	483	552	621	690
40	**16**	Push side	1256	126	251	377	502	628	754	879	1005	1130	1256
		Pull side	1055	106	211	317	422	528	633	739	844	950	1055
50	**20**	Push side	1963	196	393	589	785	982	1178	1374	1570	1767	1963
		Pull side	1649	165	330	495	660	825	989	1154	1319	1484	1649
63	**20**	Push side	3117	312	623	935	1247	1559	1870	2182	2494	2805	3117
		Pull side	2803	280	561	841	1121	1402	1682	1962	2242	2523	2803
80	**25**	Push side	5026	503	1005	1508	2010	2513	3016	3518	4021	4523	5026
		Pull side	4536	454	907	1361	1814	2268	2722	3175	3629	4082	4536
100	**30**	Push side	7853	785	1571	2356	3141	3927	4712	5497	6282	7068	7853
		Pull side	7147	715	1429	2144	2859	3574	4288	5003	5718	6432	7147
125	**35**	Push side	12271	1227	2454	3681	4908	6136	7363	8590	9817	11044	12271
		Pull side	11310	1131	2262	3393	4524	5655	6786	7917	9048	10179	11310

Pneumatic

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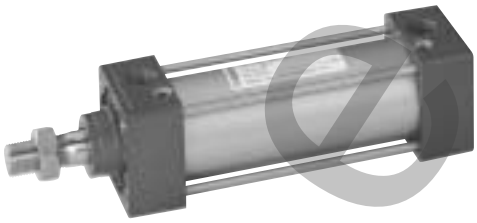
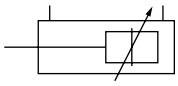
NEW DYNA Standard Cylinders



Symbol



Specifications

Item \ Bore size mm	32	40	50	63	80	100	125
Operating method	Double acting type						
Media	Air						
Mounting type	Basic type, Foot mounting type, Axis right angled foot mounting type, Rod side flange mounting type, Head side flange mounting type, Clevis mounting type, Pivot mounting type, Trunnion type						
Operating pressure range MPa{kgf/cm²}	0.05～1.0 {0.5～10.2}						
Proof pressure MPa{kgf/cm²}	1.5 {15.3}						
Operating temperature range °C	—10～70 (Freezing not allowed, with sensor is 0～60, Heat resistant type is 5～120 Note)						
Operating speed range mm/s	30～800	30～700					
Cushion	Variable cushion at both ends of stroke						
Cushion stroke mm	16		20		25		
Lubrication	Not required (But if you must use lubrication, use Turbine Oil No.1〔ISO VG32〕or equivalent)						
Port size Rc	1/8	1/4	3/8		1/2		

Bore size and Stroke

mm

Bore sizer	Standard stroke	Maximum potential manufacturing stroke: Standard specification (Aluminum tube) Heat resistant type	Maximum potential manufacturing stroke: Non-ion specification Steel tube specification
32	50, 75, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700	700	700
40	50, 75, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700	1000	1000
50	800	1500	1500
63	50, 75, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700 800, 900, 1000	1500	1500
80			
100			
125			

Remarks: 1. Stroke tolerance: Strokes of 250 or less are $^{+1}_{0}$, strokes of 251～1000 are $^{+1.5}_{0}$, and strokes of 1001 or more are $^{+2.0}_{0}$.

2. For non-standard strokes, consult us.
3. Cylinders with magnets are not available in heat resistant and steel tube specifications.
4. For the maximum potential manufacturing stroke with bellows specification, see p.104.

Order Code

DDA □ **50×100** — □ — □ — □ — □ — □ — □ — □ □ □

Bore size × **Stroke**

Non-ion specification
Blank — Standard
NCU — Non-ion specification

Tube material
Blank — Standard (Aluminum tube)
FT — Steel tube specification (Not available for cylinder with magnet.)

Types of bellows
JT — Nylon tarpaulin (～80˚C)
JC — Chloroprene (～100˚C)
JK — Cornex (～200˚C)
JA — Arumix (～250˚C)
●Cornex is a registered trademark of Teijin, Inc.
●The temperature shown is the bellows own durable temperature, and is not a temperature for cylinder use.

Sensor switch (for cylinder with magnet)

ZC130	2-lead wires	Solid state type	with indicator lamp	DC10～28V
ZC153	3-lead wires	Solid state type	with indicator lamp	DC4.5～28V
CS5T	2-lead wires	Reed switch type	without indicator lamp	DC5～28V, AC85～115V
CS11T	2-lead wires	Reed switch type	with indicator lamp	DC10～28V
CS2F	DIN type	Reed switch type	with indicator lamp	AC85～230V
CS3F	DIN type	Reed switch type	with indicator lamp	DC10～30V
CS4F	DIN type	Reed switch type	with indicator lamp	DC10～30V
CS5F	DIN type	Reed switch type	without indicator lamp	DC3～30V

●For sensor switch specifications, see p.97, while for mountings, see p.101.
●**CS□F** comes with a DIN connector. All others are grommet type.
●Orders for sensor switches only also accepted.

Number of sensor switches
1 — With one sensor switch
2 — With two sensor switches
⋮ ⋮
n — With n sensor switches

Lead wire length (Applicable to **ZC,CS□T type**)
A : 1000mm
B : 3000mm

Cylinder specification
Blank — Standard cylinders
F — Heat resistant cylinders (Not available for cylinder with magnet.) Note
J — Standard cylinder with bellows
FJ — Heat-resistant cylinder with bellows (Not available for cylinder with magnet.)

NEW DYNA Cylinders
Basic model

●Combinations of heat resistant, non-ion, and steel tube specifications are made to order.

Note: Heat resistant type not available in ϕ32 and ϕ125.

Mounting type
Blank — Basic type
1 — Foot mounting type
2 — Axis right angled foot mounting type
3 — Rod side flange mounting type
5 — Head side flange mounting type
7 — Clevis mounting type (with pin)
7-7C — Clevis mounting type (with supporting brackets)
8 — Pivot mounting type
11 — Trunnion type
11-11T — Trunnion type (with supporting bracket)
●Mounting brackets are included at time of delivery, with the exception of the trunnion type.
●Orders for mounting brackets only are also accepted.

Rod end mounting
Blank — Without rod end mounting
Y — With Y type knuckle (with pin)
I — With I type knuckle
●Place separate orders for the cylinder joint and cylinder rod end.
●Orders for rod end mountings only are also accepted.
●For rod end mountings dimensions, see p.105.

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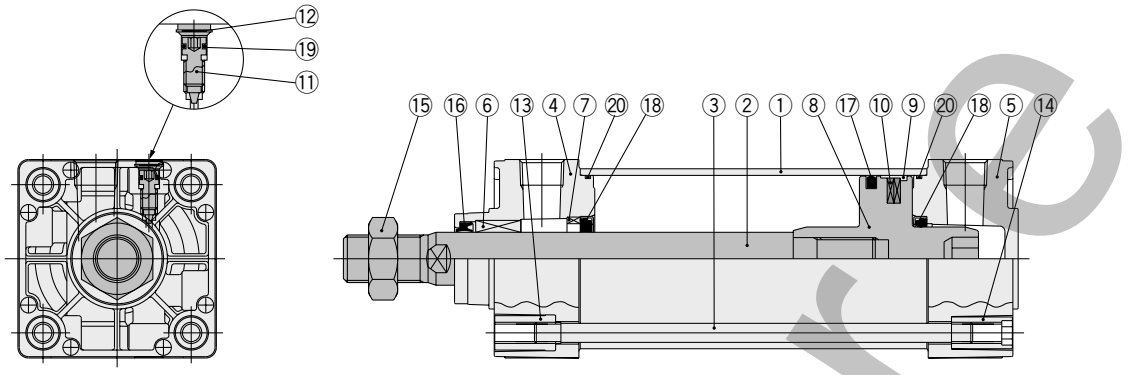
Inner Construction and Major Parts



Major Parts and Materials

No.	Parts	Materials
①	Cylinder tube	Aluminum alloy, and steel tube specification is high carbon steel
②	Piston rod	ϕ32:Stainless steel, ϕ40~ ϕ125:Carbon steel for machine structural use
③	Tie rod	Carbon steel for machine structural use
④	Rod cover	Aluminum die-cast
⑤	Head cover	Aluminum die-cast
⑥	Rod bushing	Oil-permeated sintered copper alloy
⑦	Keep ring	Aluminum alloy
⑧	Piston	Aluminum alloy
⑨	Wear ring	Plastic
⑩	Magnet	Rubber magnet
⑪	Cushion needle	Carbon steel for machine structural use
⑫	Snap ring	Spring steel
⑬	Tie rod nut R	Rolled steel for general structural use
⑭	Tie rod nut H	Chrome-molybdenum steel
⑮	Rod end nut	Rolled steel for general structural use
⑯	Rod seal	Synthetic rubber (NBR)

No.	Parts	Materials
⑰	Piston seal	Synthetic rubber（NBR）
⑱	Cushion seal	Synthetic rubber（NBR）
⑲	Cushion gasket	Synthetic rubber（NBR）
⑳	Tube gasket	Synthetic rubber（NBR）
—	Foot bracket	Rolled steel for general structural use
—	Axial right angled foot bracket	Cast iron
—	Flange mounting bracket	Rolled steel for general structural use
—	Clevis mounting bracket	Cast iron
—	Clevis supporting bracket	Cast iron
—	Pivot bracket	Cast iron
—	Trunnion bracket	Cast iron
—	Trunnion supporting bracket	Cast iron
—	Knuckles	Cast iron[Note]

Note:The I knuckle for ϕ 125 only, is carbon steel for machine structural use

Seals

Parts / Bore size mm \ Quantity	Rod seal	Piston seal	Cushion seal	Tube gasket	Cushion gasket
	1★	1★	2	2★	2
32	DRP12	PWP32N	CPF15	1.5×32	S5
40	DRP16 (DRP16F)	PWP40N (PSD-40F)	CPF20 (PCS20F)	1.5×40	S5
50	DRP20 (DRP20F)	PWP50N (PSD-50F)	CPF24 (PCS24F)	1.5×50	S6
63	DRP20 (DRP20F)	PWP63N (PSD-63F)	CPF24 (PCS24F)	1.5×63	S6
80	DRP25 (DRP25F)	PWP80N (PSD-80F)	CPF30 (PCS30F)	1.5×80	S6
100	DRP30 (DRP30F)	PWP100N (PSD-100F)	CPF35 (PCS35F)	1.5×100	S6
125	DRP35	PWP125N	CPF45	2.0×125	S7

Remarks: 1. Items in parentheses ( ) are for heat resistant specifications.
2. Starred ★ designate items available as repair kits.
Order code
For standard cylinders･･･**SRK-NDDA** Bore size

Mass

kg

Bore size mm	Mass at zero stroke									Additional mass for each 1mm stroke	Mass of one sensor switch [with holder]		Mass of knuckle	
	Basic type	Foot mounting type	Axial perpendicular foot mounting type	Flange mounting type	Clevis mounting type (with pin)	Clevis mounting typ (with supporting bracket)	Pivot mounting type	Trunnion type	Trunnion type (with supporting bracket)		ZC□□□ CS□T Note	CS□F	Y type knuckle (with pin)	I type knuckle
32	0.57 (0.60)	0.68 (0.71)	0.71 (0.74)	0.77 (0.80)	0.76 (0.79)	1.22 (1.25)	0.69 (0.72)	0.87 (0.90)	1.09 (1.12)	0.00218 (0.00324)	0.04	0.05	0.22	0.16
40	0.65 (0.69)	0.78 (0.82)	0.85 (0.89)	1.02 (1.06)	0.92 (0.96)	1.62 (1.66)	0.83 (0.87)	1.13 (1.17)	1.63 (1.67)	0.00300 (0.00431)			0.27	0.16
50	1.02 (1.08)	1.19 (1.25)	1.34 (1.40)	1.41 (1.47)	1.41 (1.47)	2.11 (2.17)	1.28 (1.34)	1.57 (1.63)	2.07 (2.13)	0.00428 (0.00635)			0.34	0.21
63	1.36 (1.44)	1.59 (1.67)	1.88 (1.96)	1.89 (1.97)	1.84 (1.92)	2.54 (2.62)	1.78 (1.86)	2.06 (2.14)	2.56 (2.64)	0.00515 (0.00773)	0.04	0.06	0.34	0.21
80	2.32 (2.49)	2.70 (2.87)	3.17 (3.34)	3.92 (4.09)	3.24 (3.41)	3.96 (4.13)	3.40 (3.57)	3.48 (3.65)	4.20 (4.37)	0.00834 (0.01302)			0.87	0.62
100	2.94 (3.15)	3.41 (3.62)	4.22 (4.43)	5.16 (5.37)	4.18 (4.39)	4.90 (5.11)	4.33 (4.54)	4.47 (4.68)	5.19 (5.40)	0.01061 (0.01642)			1.47	1.24
125	4.43 (4.77)	4.90 (5.24)	5.81 (6.15)	7.30 (7.64)	6.40 (6.74)	9.21 (9.55)	6.88 (7.22)	7.84 (8.18)	9.39 (9.73)	0.01490 (0.02311)	0.046	0.066	1.47	1.24

Note: For lead wire length A (1000mm).
Remark: Figures in parentheses ( ) are for steel tube specifications.

Calculation example: For a foot mounting type with bore size of 50mm, and a 100mm stroke 1.19+(0.00428×100)=1.618kg

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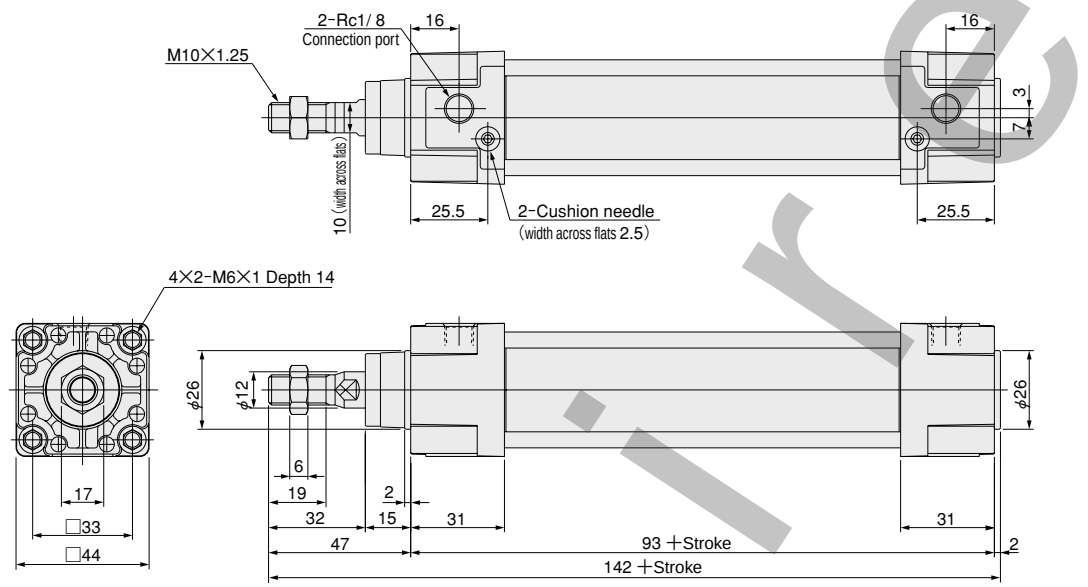
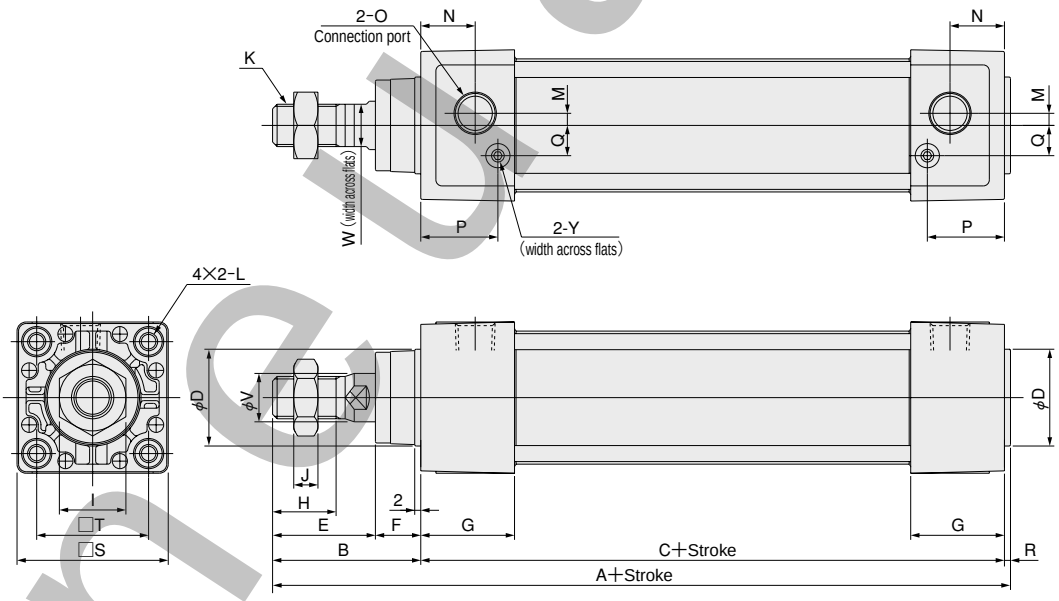
Dimensions of Basic Type (Unit mm)

DDA 32× Stroke



DDA Bore size × Stroke



Bore size \ Code	A	B	C	D	E	F	G	H	I	J	K	L
40	144	49	93	32	34	15	31	21	22	8	M14×1.5	M 6×1 Depth 14
50	152	57	93	38	42	15	31	29	27	11	M18×1.5	M 6×1 Depth 14
63	155	57	96	38	42	15	32	29	27	11	M18×1.5	M 8×1.25 Depth 14
80	185	75	108	44	54	21	36	37	32	13	M22×1.5	M10×1.5 Depth 15
100	185	75	108	50	54	21	36	37	36	14	M26×1.5	M10×1.5 Depth 15
125	205	89	114	60	68	21	36	50	36	16	M27×2	M12×1.75 Depth 15

Bore size \ Code	M	N	O	P	Q	R	S	T	V	W	Y
40	4	18	Rc1/4	25.5	10	2	50	37	16	14	2.5
50	7	18	Rc3/8	24	12	2	62	47	20	17	3
63	8	18	Rc3/8	25	12	2	75	56	20	17	3
80	11	20	Rc1/2	29	16	2	94	70	25	21	3
100	12	20	Rc1/2	29	18	2	112	84	30	26	3
125	14	20	Rc1/2	29	20	2	136	104	35	32	3

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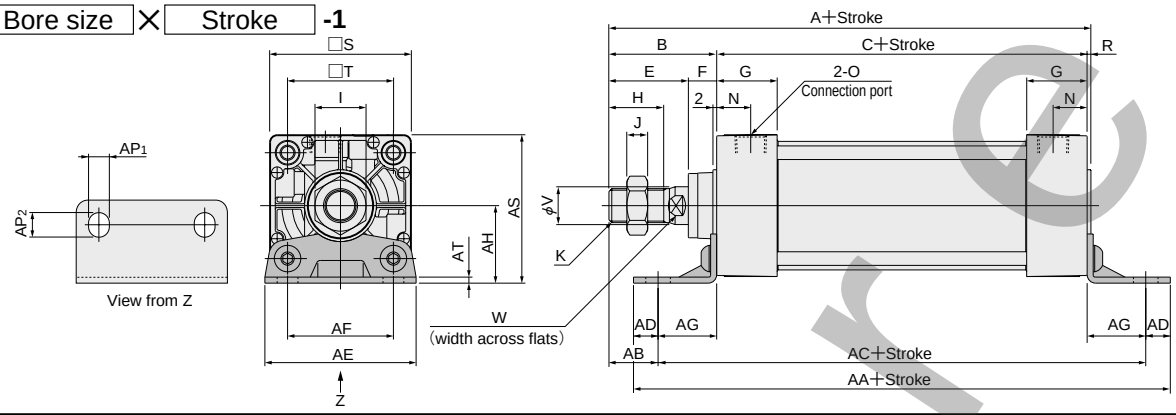
Dimensions of Foot Mounting Type (Unit mm)

DDA Bore size × Stroke **-1**

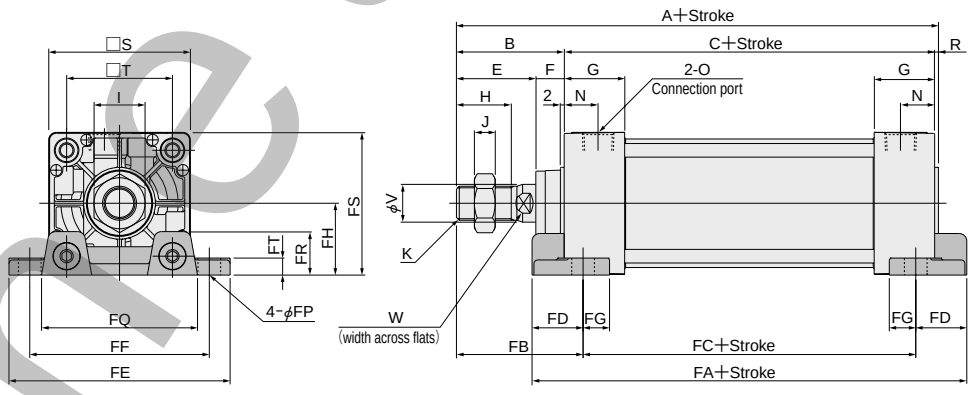


Bore size \ Code	A	B	C	E	F	G	H	I	J	K	N	O	R	S	T	V	W
32	142	47	93	32	15	31	19	17	6	M10×1.25	16	Rc1/8	2	44	33	12	10
40	144	49	93	34	15	31	21	22	8	M14×1.5	18	Rc1/4	2	50	37	16	14
50	152	57	93	42	15	31	29	27	11	M18×1.5	18	Rc3/8	2	62	47	20	17
63	155	57	96	42	15	32	29	27	11	M18×1.5	18	Rc3/8	2	75	56	20	17
80	185	75	108	54	21	36	37	32	13	M22×1.5	20	Rc1/2	2	94	70	25	21
100	185	75	108	54	21	36	37	36	14	M26×1.5	20	Rc1/2	2	112	84	30	26
125	205	89	114	68	21	36	50	36	16	M27×2	20	Rc1/2	2	136	104	35	32

Bore size \ Code	AA	AB	AC	AD	AE	AF	AG	AH	AP_1	AP_2	AS	AT
32	153	26.5	134	9.5	50	33	20.5	28	9	11	50	3.2
40	165	25.5	140	12.5	57	36	23.5	30	11	13	55	3.2
50	173	29	149	12	68	47	28	36.5	11	13	67.5	3.2
63	184	26	158	13	80	56	31	41	11	13	78.5	3.2
80	200	45	168	16	97	70	30	49	14	16	96	4
100	200	45	168	16	112	84	30	57	14	16	113	4
125	220	54	184	18	136	104	35	70	18	20	138	6

Dimensions of Axis Right Angled Foot Mounting Type (Unit mm)

DDA Bore size × Stroke **-2**



Bore size \ Code	A	B	C	E	F	G	H	I	J	K	N	O	R	S	T	V	W
32	142	47	93	32	15	31	19	17	6	M10×1.25	16	Rc1/8	2	44	33	12	10
40	144	49	93	34	15	31	21	22	8	M14×1.5	18	Rc1/4	2	50	37	16	14
50	152	57	93	42	15	31	29	27	11	M18×1.5	18	Rc3/8	2	62	47	20	17
63	155	57	96	42	15	32	29	27	11	M18×1.5	18	Rc3/8	2	75	56	20	17
80	185	75	108	54	21	36	37	32	13	M22×1.5	20	Rc1/2	2	94	70	25	21
100	185	75	108	54	21	36	37	36	14	M26×1.5	20	Rc1/2	2	112	84	30	26
125	205	89	114	68	21	36	50	36	16	M27×2	20	Rc1/2	2	136	104	35	32

Bore size \ Code	FA	FB	FC	FD	FE	FF	FG	FH	FP	FQ	FR	FS	FT
32	119	57	73	23	81	63	14	22	9	54	14	44	8
40	119	59	73	23	92	70	14	25	12	58	16	50	8
50	123	67	73	25	105	83	14	31	12	68	17	62	9
63	130	67	76	27	117	95	14	38	12	84	22	75.5	9
80	150	88	82	34	147	121	18	47	14	104	28	94	13
100	158	88	82	38	168	140	18	57	14	120	30	113	14
125	172	106	80	46	213	175	21	69	18	144	35	137	18

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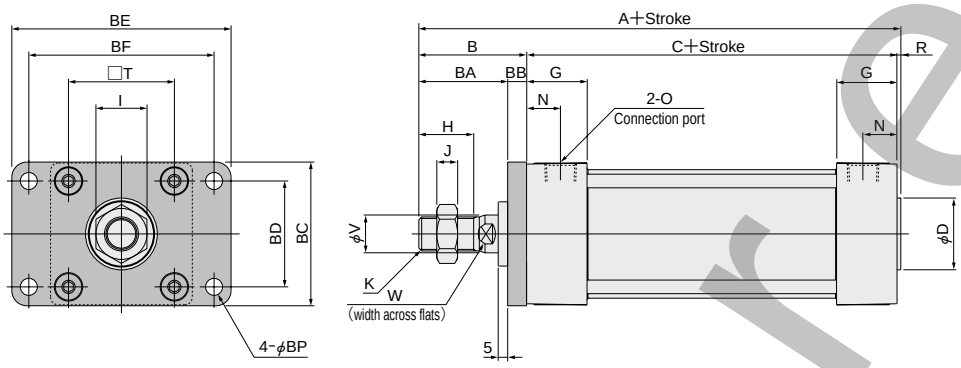
Dimensions of Rod Side Flange Mounting Type (Unit mm)

DDA Bore size × Stroke **-3**

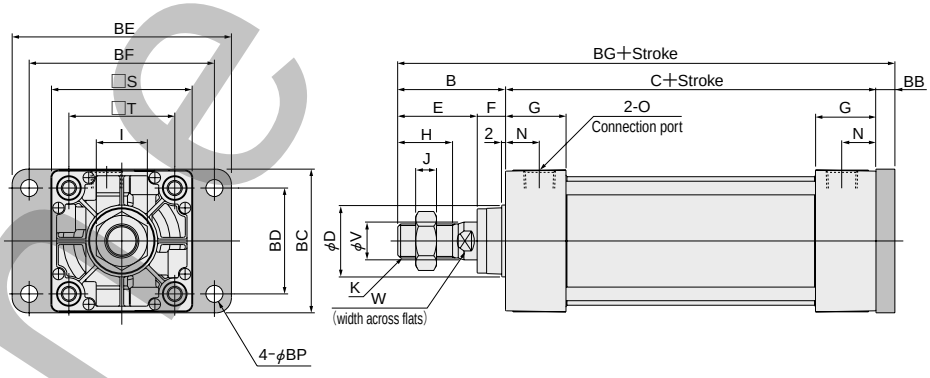


Bore size \ Code	A	B	C	D	G	H	I	J	K	N	O	R	T	V	W
32	142	47	93	26	31	19	17	6	M10×1.25	16	Rc1/8	2	33	12	10
40	144	49	93	32	31	21	22	8	M14×1.5	18	Rc1/4	2	37	16	14
50	152	57	93	38	31	29	27	11	M18×1.5	18	Rc3/8	2	47	20	17
63	155	57	96	38	32	29	27	11	M18×1.5	18	Rc3/8	2	56	20	17
80	185	75	108	44	36	37	32	13	M22×1.5	20	Rc1/2	2	70	25	21
100	185	75	108	50	36	37	36	14	M26×1.5	20	Rc1/2	2	84	30	26
125	205	89	114	60	36	50	36	16	M27×2	20	Rc1/2	2	104	35	32

Bore size \ Code	BA	BB	BC	BD	BE	BF	BP
32	37	10	47	33	72	58	7
40	39	10	52	36	84	70	7
50	47	10	65	47	104	86	9
63	47	10	76	56	116	98	9
80	59	16	95	70	143	119	12
100	59	16	115	84	162	138	12
125	73	16	138	104	196	168	14

Dimensions of Head Side Flange Mounting Type (Unit mm)

DDA Bore size × Stroke **-5**



Bore size \ Code	B	C	D	E	F	G	H	I	J	K	N	O	S	T	V	W
32	47	93	26	32	15	31	19	17	6	M10×1.25	16	Rc1/8	44	33	12	10
40	49	93	32	34	15	31	21	22	8	M14×1.5	18	Rc1/4	50	37	16	14
50	57	93	38	42	15	31	29	27	11	M18×1.5	18	Rc3/8	62	47	20	17
63	57	96	38	42	15	32	29	27	11	M18×1.5	18	Rc3/8	75	56	20	17
80	75	108	44	54	21	36	37	32	13	M22×1.5	20	Rc1/2	94	70	25	21
100	75	108	50	54	21	36	37	36	14	M26×1.5	20	Rc1/2	112	84	30	26
125	89	114	60	68	21	36	50	36	16	M27×2	20	Rc1/2	136	104	35	32

Bore size \ Code	BB	BC	BD	BE	BF	BG	BP
32	10	47	33	72	58	150	7
40	10	52	36	84	70	152	7
50	10	65	47	104	86	160	9
63	10	76	56	116	98	163	9
80	16	95	70	143	119	199	12
100	16	115	84	162	138	199	12
125	16	138	104	196	168	219	14

Preview

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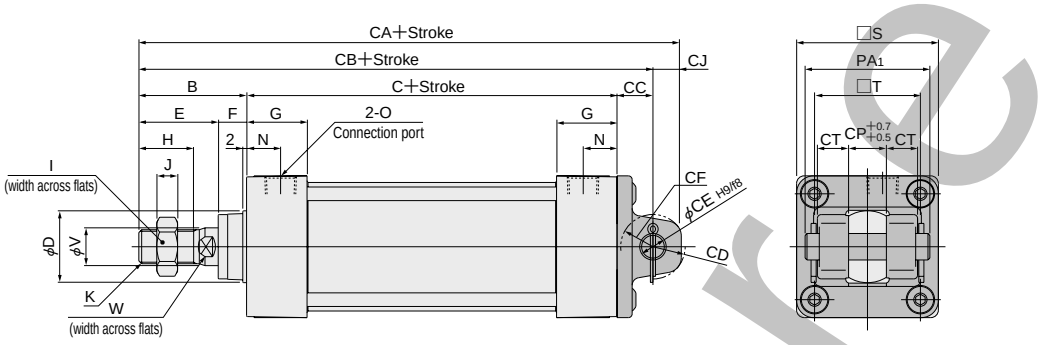
Dimensions of Clevis Mounting Type (Unit mm)

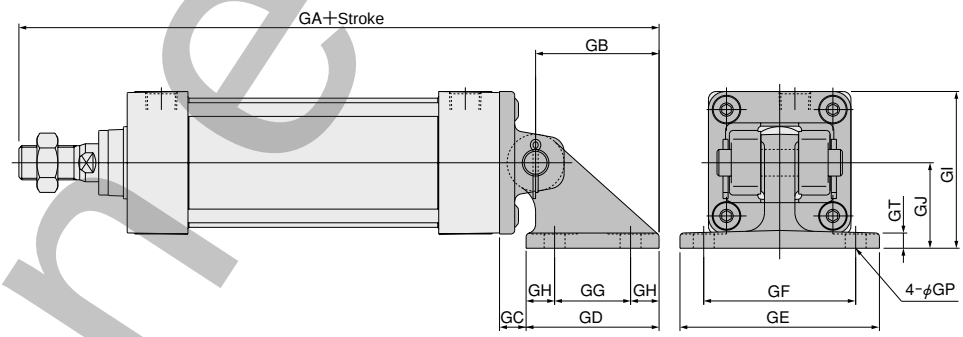
DDA Bore size × Stroke **-7**



Bore size \ Code	B	C	D	E	F	G	H	I	J	K	N	O	S	T	V	W
32	47	93	26	32	15	31	19	17	6	M10×1.25	16	Rc1/8	44	33	12	10
40	49	93	32	34	15	31	21	22	8	M14×1.5	18	Rc1/4	50	37	16	14
50	57	93	38	42	15	31	29	27	11	M18×1.5	18	Rc3/8	62	47	20	17
63	57	96	38	42	15	32	29	27	11	M18×1.5	18	Rc3/8	75	56	20	17
80	75	108	44	54	21	36	37	32	13	M22×1.5	20	Rc1/2	94	70	25	21
100	75	108	50	54	21	36	37	36	14	M26×1.5	20	Rc1/2	112	84	30	26
125	89	114	60	68	21	36	50	36	16	M27×2	20	Rc1/2	136	104	35	32

Bore size \ Code	CA	CB	CC	CD	CE	CF	CJ	CP	CT	PA_1
32	172	159	19	R15	12	R17	13	16	8.5	46
40	174	161	19	R15	14	R17	13	20	12.5	58
50	184	169	19	R17	14	R17	15	20	16.5	66
63	187	172	19	R17	14	R17	15	20	16.5	66
80	236	215	32	R24	20	R30	21	32	17.5	78
100	236	215	32	R24	20	R30	21	32	17.5	78
125	251	235	32	R22	20	R30	16	32	16.5	78

●With Supporting Bracket DDA Bore size × Stroke **-7-7C**



Bore size \ Code	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GP	GT
32	215.5	56.5	12.5	63	85	65	40	11.5	57	35	9(Thru hole)	8
40	227.5	66.5	12.5	73	105	80	40	16.5	70	45	11(Thru hole)	8
50	235.5	66.5	12.5	73	105	80	40	16.5	76	45	11(Thru hole)	8
63	238.5	66.5	12.5	73	105	80	40	16.5	82.5	45	11(Thru hole)	8
80	301.5	86.5	20.5	98	135	105	65	16.5	107	60	14(Thru hole)	12
100	301.5	86.5	20.5	98	135	105	65	16.5	116	60	14(Thru hole)	12
125	349.5	114.5	29.5	117	145	110	77	20	143	75	18(Thru hole)	15

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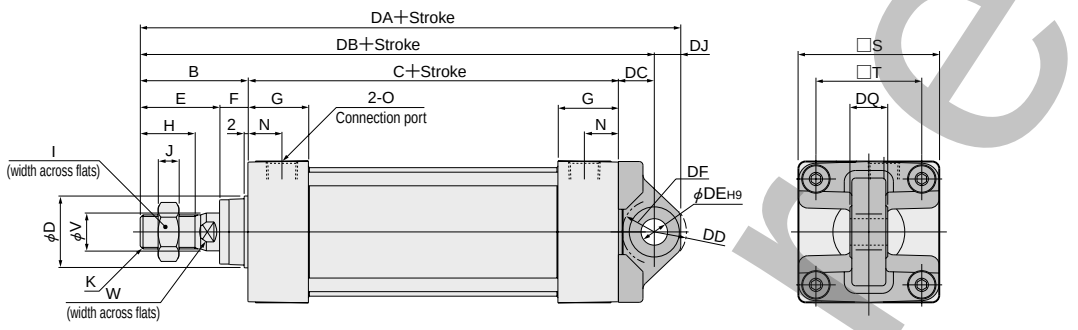
Dimensions of Pivot Mounting Type (Unit mm)

DDA Bore size × Stroke **-8**



Bore size \ Code	B	C	D	E	F	G	H	I	J	K	N	O	S	T	V	W
32	47	93	26	32	15	31	19	17	6	M10×1.25	16	Rc1/8	44	33	12	10
40	49	93	32	34	15	31	21	22	8	M14×1.5	18	Rc1/4	50	37	16	14
50	57	93	38	42	15	31	29	27	11	M18×1.5	18	Rc3/8	62	47	20	17
63	57	96	38	42	15	32	29	27	11	M18×1.5	18	Rc3/8	75	56	20	17
80	75	108	44	54	21	36	37	32	13	M22×1.5	20	Rc1/2	94	70	25	21
100	75	108	50	54	21	36	37	36	14	M26×1.5	20	Rc1/2	112	84	30	26
125	89	114	60	68	21	36	50	36	16	M27×2	20	Rc1/2	136	104	35	32

Bore size \ Code	DA	DB	DC	DD	DE	DF	DJ	DQ
32	172	159	19	R16	12	R16	13	$16\ ^{0}_{-0.070}$
40	175	161	19	R17	14	R17	14	$20\ ^{0}_{-0.084}$
50	183	169	19	R17	14	R17	14	$20\ ^{0}_{-0.084}$
63	186	172	19	R17	14	R17	14	$20\ ^{0}_{-0.084}$
80	236	215	32	R24	20	R25	21	$32\ ^{0}_{-0.100}$
100	235	215	32	R24	20	R26	20	$32\ ^{0}_{-0.100}$
125	255	235	32	R25	20	R30	20	$32\ ^{0}_{-0.100}$

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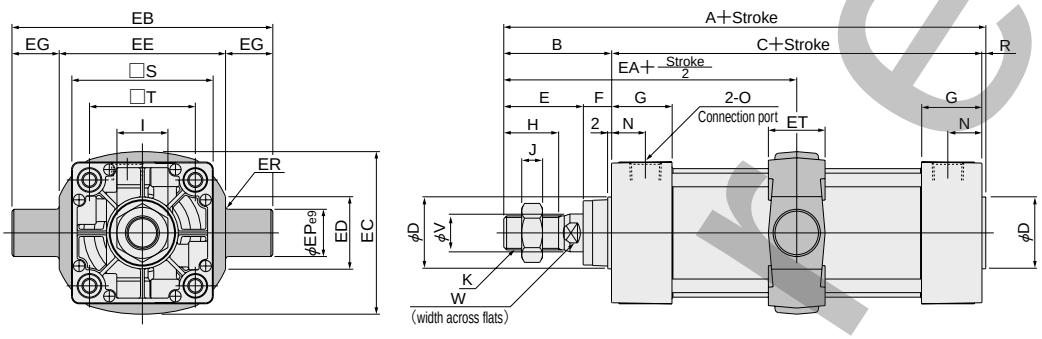
Dimensions of Trunnion Type (Unit mm)

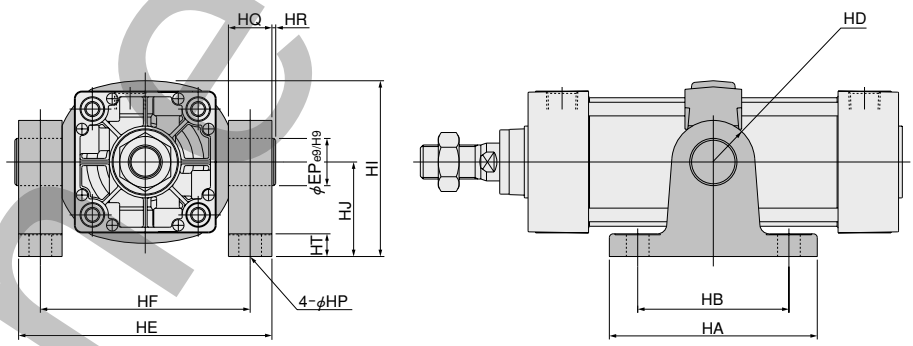
DDA Bore size × Stroke **-11**



Bore size \ Code	A	B	C	D	E	F	G	H	I	J	K	N	O	R	S	T	V	W
32	142	47	93	26	32	15	31	19	17	6	M10×1.25	16	Rc1/8	2	44	33	12	10
40	144	49	93	32	34	15	31	21	22	8	M14×1.5	18	Rc1/4	2	50	37	16	14
50	152	57	93	38	42	15	31	29	27	11	M18×1.5	18	Rc3/8	2	62	47	20	17
63	155	57	96	38	42	15	32	29	27	11	M18×1.5	18	Rc3/8	2	75	56	20	17
80	185	75	108	44	54	21	36	37	32	13	M22×1.5	20	Rc1/2	2	94	70	25	21
100	185	75	108	50	54	21	36	37	36	14	M26×1.5	20	Rc1/2	2	112	84	30	26
125	205	89	114	60	68	21	36	50	36	16	M27×2	20	Rc1/2	2	136	104	35	32

Bore size \ Code	EA	EB	EC	ED	EE	EG	EP	ER	ET
32	93.5	87	53	20	55	16	16	R1	30
40	95.5	113	60	30	63	25	25	R1.6	30
50	103.5	126	72	30	76	25	25	R1.6	30
63	105	138	87	40	88	25	25	R1.6	30
80	129	164	105	40	114	25	25	R1.6	35
100	129	182	129	44	132	25	25	R2	40
125	146	208	159	37.5	158	25	25	R2	43

●With Supporting Bracket **DDA** Bore size × Stroke **-11-11T**



Bore size \ Code	HA	HB	HD	HE	HF	HI	HJ	HP	HQ	HR	HT	EP
32	81	60	R16	85	70	66.5	40	9(Thru hole)	15	1	12	16
40	111	80	R22	109	86	80	50	12(Thru hole)	23	2	14	25
50	111	80	R22	122	99	86	50	12(Thru hole)	23	2	14	25
63	111	80	R22	134	111	93.5	50	12(Thru hole)	23	2	14	25
80	121	85	R22	160	137	122.5	70	14(Thru hole)	23	2	14	25
100	121	85	R22	178	155	134.5	70	14(Thru hole)	23	2	14	25
125	145	105	R30	208	183	164.5	85	18(Thru hole)	25	0	27	25

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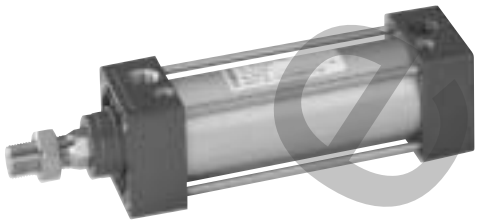
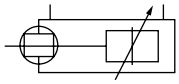
NEW DYNA Non-Rotating Cylinders



Symbol



Specifications

Item \ Bore size mm	40	50	63	80	100
Operating method	Double acting type				
Media	Air				
Mounting type	Basic type, Foot mounting type, Axis right angled foot mounting type, Rod side flange mounting type, Head side flange mounting type, Clevis mounting type, Pivot mounting type, Trunnion type				
Operating pressure range MPa {kgf/cm²}	0.1～1.0 {1.0～10.2}				
Proof pressure MPa {kgf/cm²}	1.5 {15.3}				
Operating temperature range °C	—10～70 (Freezing not allowed, with sensor is 0～60.)				
Operating speed range mm/s	50～500				
Cushion	Variable cushion at both ends of stroke				
Cushion stroke mm	16	20		25	
Lubrication	Not required (But if you must use lubrication, use Turbine oil Class 1〔ISO VG32〕or equivalent)				
Non-rotating accuracy	±1°	±0.8°		±0.5°	
Allowable torque N·m {kgf·m}	1 {0.1}	3.4 {0.35}		10 {1.02}	
Port size Rc	1/4	3/8		1/2	

Bore size and Stroke

mm

Bore sizer	Standard stroke	Maximum potential manufacturing stroke
40	50, 75, 100, 150, 200, 250, 300, 350, 400, 450, 500	500
50		
63		
80		
100		

Remarks:
1. Stroke tolerance: Strokes of 250 or less are $^{+1}_{0}$, strokes of 251～500 are $^{+1.5}_{0}$.
2. For non-standard strokes, consult us.
3. Cylinders with magnets are not available in steel tube specifications.
4. For the maximum potential manufacturing stroke with bellows specification, see p.104.

Order Code

DDA □ **50×100** — □ — □ — □ — □ — □ — □ □

NEW DYNA Cylinders Basic model

Bore size × Stroke

Cylinder specification
- **L** — Non-rotating cylinder
- **JL** — Non-rotating cylinder with bellows

Types of bellows
- **JT** — Nylon tarpaulin (～80˚C)
- **JC** — Chloroprene (～100˚C)
- **JK** — Cornex (～200˚C)
- **JA** — Arumix (～250˚C)

●Cornex is a registered trademark of Teijin, Inc.
●The temperature shown is the bellows own durable temperature, and is not a temperature for cylinder use.

Tube material
- **Blank** — Standard (Aluminum tube)
- **FT** — Steel tube specification (Not available for cylinder with magnet.)

Mounting type
- **Blank** — Basic type
- **1** — Foot mounting type
- **2** — Axis right angled foot mounting type
- **3** — Rod side flange mounting type
- **5** — Head side flange mounting type
- **7** — Clevis mounting type (with pin)
- **7-7C** — Clevis mounting type (with supporting brackets)
- **8** — Pivot mounting type
- **11** — Trunnion type
- **11-11T** — Trunnion type (with supporting bracket)

●Mounting brackets are included at time of delivery, with the exception of the trunnion type.
●Orders for mounting brackets only are also accepted.

Rod end mounting
- **Blank** — Without rod end mounting
- **Y** — With Y type knuckle (with pin)
- **I** — With I type knuckle

●Place separate orders for the cylinder joint and cylinder rod end.
●Orders for rod end mountings only are also accepted.
●For rod end mountings dimensions, see p.105.

Lead wire length (Applicable to **ZC,CS□T type**)
- **A** : 1000mm
- **B** : 3000mm

Sensor switch (for cylinder with magnet)

ZC130	2-lead wires	Solid state type	with indicator lamp	DC10～28V
ZC153	3-lead wires	Solid state type	with indicator lamp	DC4.5～28V
CS5T	2-lead wires	Reed switch type	without indicator lamp	DC5～28V, AC85～115V
CS11T	2-lead wires	Reed switch type	with indicator lamp	DC10～28V
CS2F	DIN type	Reed switch type	with indicator lamp	AC85～230V
CS3F	DIN type	Reed switch type	with indicator lamp	DC10～30V
CS4F	DIN type	Reed switch type	with indicator lamp	DC10～30V
CS5F	DIN type	Reed switch type	without indicator lamp	DC3～30V

●For sensor switch specifications, see p.97, while for mountings, see p.101.
●Cylinders with magnets are not available in steel tube specifications.
●**CS□F** comes with a DIN connector. All others are grommet type.
●Orders for sensor switches only are also accepted.

Number of sensor switches
- **1** — With one sensor switch
- **2** — With two sensor switches
- ⋮ ⋮
- **n** — With n sensor switches

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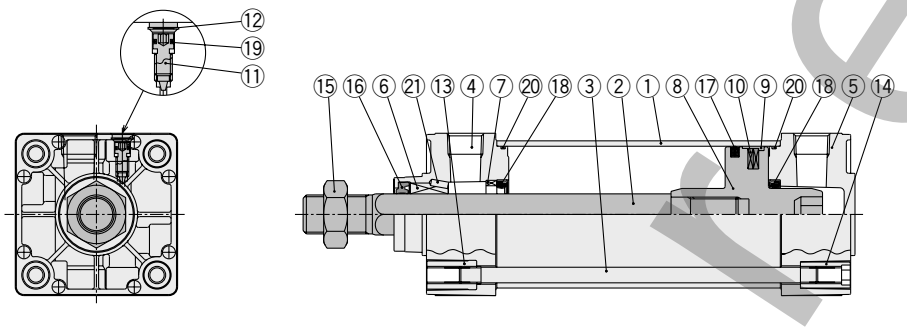
Inner Construction and Major Parts



Major Parts and Materials

No.	Parts	Materials
①	Cylinder tube	Aluminum alloy, and steel tube specifications are high carbon steel
②	Piston rod	Carbon steel for machine structural use
③	Tie rod	Carbon steel for machine structural use
④	Rod cover	Aluminum die-cast
⑤	Head cover	Aluminum die-cast
⑥	Rod bushing	Aluminum alloy
⑦	Keep ring	Aluminum alloy
⑧	Piston	Aluminum alloy
⑨	Wear ring	Plastic
⑩	Magnet	Rubber magnet
⑪	Cushion needle	Carbon steel for machine structural use
⑫	Snap ring	Spring steel
⑬	Tie rod nut R	Rolled steel for general structural use
⑭	Tie rod nut H	Chrome-molybdenum steel
⑮	Rod end nut	Rolled steel for general structural use

No.	Parts	Materials
⑯	Rod seal	Urethane rubber
⑰	Piston seal	Synthetic rubber (NBR)
⑱	Cushion seal	Synthetic rubber (NBR)
⑲	Cushion gasket	Synthetic rubber (NBR)
⑳	Tube gasket	Synthetic rubber (NBR)
㉑	Spring pin	Carbon steel for machine structural use
—	Foot bracket	Rolled steel for general structural use
—	Axial right angled foot bracket	Cast iron
—	Flange mounting bracket	Rolled steel for general structural use
—	Clevis mounting bracket	Cast iron
—	Clevis supporting bracket	Cast iron
—	Pivot bracket	Cast iron
—	Trunnion bracket	Cast iron
—	Trunnion supporting bracket	Cast iron
—	Knuckles	Cast iron

Seals

Parts	Rod seal	Piston seal	Cushion seal	Tube gasket	Cushion gasket
Bore size mm \ Quantity	1	1	2	2	2
40	PGR14A	PWP40N	CPF20	1.5×40	S5
50	PGR19	PWP50N	CPF24	1.5×50	S6
63	PGR19	PWP63N	CPF24	1.5×63	S6
80	PGR23	PWP80N	CPF30	1.5×80	S6
100	PGR23	PWP100N	CPF35	1.5×100	S6

Mass

kg

Bore size mm	Mass at zero stroke									Additional mass for each 1mm stroke	Mass of one sensor switch [with holder]		Mass of knuckle	
	Basic type	Foot mounting type	Axis right angled foot mounting type	Flange mounting type	Clevis mounting type	Clevis mounting type (with supporting bracket)	Pivot mounting type	Trunnion type	Trunnion type (with supporting bracket)		ZC□□□ CS□T Note	CS□F	Y type knuckle (with pin)	I type knuckle
40	0.65 (0.69)	0.78 (0.82)	0.85 (0.89)	1.02 (1.06)	0.92 (0.96)	1.62 (1.66)	0.83 (0.87)	1.13 (1.17)	1.63 (1.67)	0.00276 (0.00407)	0.04	0.05	0.27	0.16
50	1.02 (1.08)	1.19 (1.25)	1.34 (1.40)	1.41 (1.47)	1.41 (1.47)	2.11 (2.17)	1.28 (1.34)	1.57 (1.63)	2.07 (2.13)	0.00425 (0.00632)			0.34	0.21
63	1.36 (1.44)	1.59 (1.67)	1.88 (1.96)	1.89 (1.97)	1.84 (1.92)	2.54 (2.62)	1.78 (1.86)	2.06 (2.14)	2.56 (2.64)	0.00512 (0.00770)	0.04	0.06	0.34	0.21
80	2.32 (2.49)	2.70 (2.87)	3.17 (3.34)	3.92 (4.09)	3.24 (3.41)	3.96 (4.13)	3.40 (3.57)	3.48 (3.65)	4.20 (4.37)	0.00810 (0.01278)			0.87	0.62
100	2.94 (3.15)	3.41 (3.62)	4.22 (4.43)	5.16 (5.37)	4.18 (4.39)	4.90 (5.11)	4.33 (4.54)	4.47 (4.68)	5.19 (5.40)	0.00869 (0.01450)			0.87	0.62

Note: For lead wire length A (1000mm).
Remark: Figures in parentheses ( ) are for steel tube specifications.

Calculation example: For a foot mounting type with bore size of 50mm, and a 100mm stroke 1.19+(0.00425×100)=1.615kg

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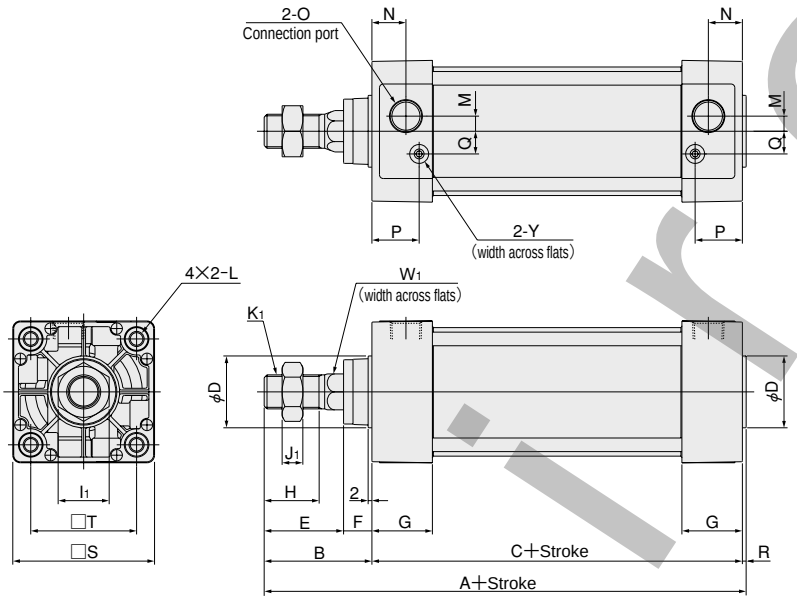
Dimensions of Basic Type (Unit mm)

DDAL Bore size × Stroke



Bore size \ Code	A	B	C	D	E	F	G	H	I_1	J_1	K_1
40	144	49	93	32	34	15	31	21	19	7	M12×1.25
50	152	57	93	38	42	15	31	29	27	11	M18×1.5
63	155	57	96	38	42	15	32	29	27	11	M18×1.5
80	185	75	108	44	54	21	36	37	32	13	M22×1.5
100	185	75	108	50	54	21	36	37	32	13	M22×1.5

Bore size \ Code	L	M	N	O	P	Q	R	S	T	W_1	Y
40	M 6×1 Depth 14	4	18	Rc1/4	25.5	10	2	50	37	14	2.5
50	M 6×1 Depth 14	7	18	Rc3/8	24	12	2	62	47	19	3
63	M 8×1.25 Depth 14	8	18	Rc3/8	25	12	2	75	56	19	3
80	M10×1.5 Depth 15	11	20	Rc1/2	29	16	2	94	70	23	3
100	M10×1.5 Depth 15	12	20	Rc1/2	29	18	2	112	84	23	3

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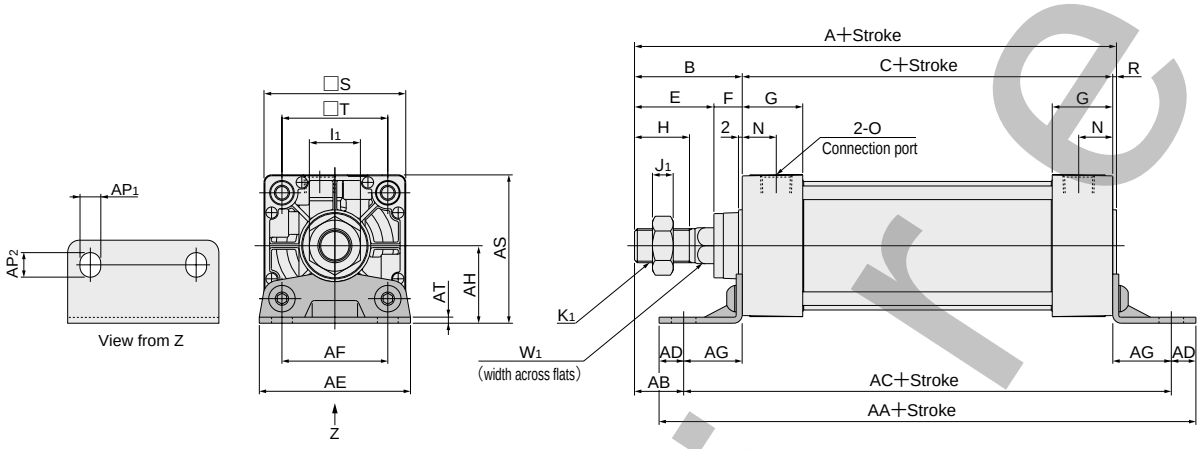
Dimensions of Foot Mounting Type (Unit mm)

DDAL Bore size × Stroke **-1**

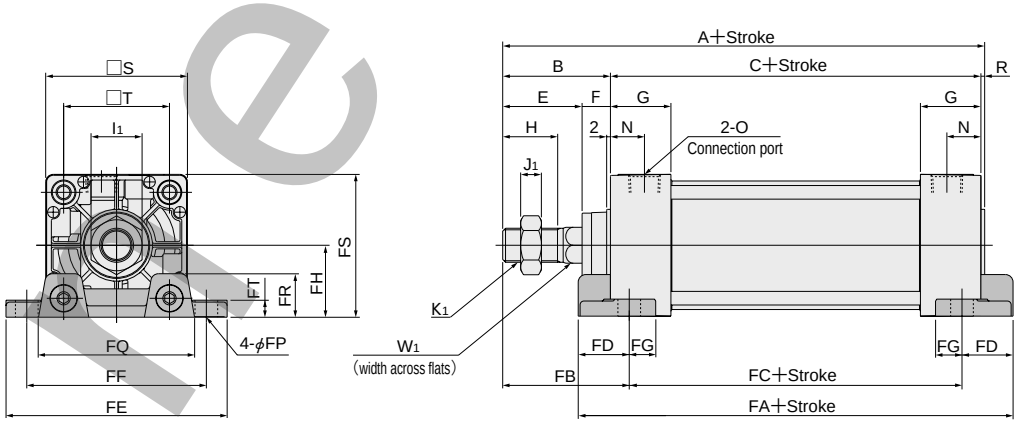


Bore size \ Code	A	B	C	E	F	G	H	I_1	J_1	K_1	N	O	R	S	T	W_1
40	144	49	93	34	15	31	21	19	7	M12×1.25	18	Rc1/4	2	50	37	14
50	152	57	93	42	15	31	29	27	11	M18×1.5	18	Rc3/8	2	62	47	19
63	155	57	96	42	15	32	29	27	11	M18×1.5	18	Rc3/8	2	75	56	19
80	185	75	108	54	21	36	37	32	13	M22×1.5	20	Rc1/2	2	94	70	23
100	185	75	108	54	21	36	37	32	13	M22×1.5	20	Rc1/2	2	112	84	23

Bore size \ Code	AA	AB	AC	AD	AE	AF	AG	AH	AP_1	AP_2	AS	AT
40	165	25.5	140	12.5	57	36	23.5	30	11	13	55	3.2
50	173	29	149	12	68	47	28	36.5	11	13	67.5	3.2
63	184	26	158	13	80	56	31	41	11	13	78.5	3.2
80	200	45	168	16	97	70	30	49	14	16	96	4
100	200	45	168	16	112	84	30	57	14	16	113	4

Dimensions of Axis Right Angled Foot Mounting Type (Unit mm)

DDAL Bore size × Stroke **-2**



Bore size \ Code	A	B	C	E	F	G	H	I_1	J_1	K_1	N	O	R	S	T	W_1
40	144	49	93	34	15	31	21	19	7	M12×1.25	18	Rc1/4	2	50	37	14
50	152	57	93	42	15	31	29	27	11	M18×1.5	18	Rc3/8	2	62	47	19
63	155	57	96	42	15	32	29	27	11	M18×1.5	18	Rc3/8	2	75	56	19
80	185	75	108	54	21	36	37	32	13	M22×1.5	20	Rc1/2	2	94	70	23
100	185	75	108	54	21	36	37	32	13	M22×1.5	20	Rc1/2	2	112	84	23

Bore size \ Code	FA	FB	FC	FD	FE	FF	FG	FH	FP	FQ	FR	FS	FT
40	119	59	73	23	92	70	14	25	12	58	16	50	8
50	123	67	73	25	105	83	14	31	12	68	17	62	9
63	130	67	76	27	117	95	14	38	12	84	22	75.5	9
80	150	88	82	34	147	121	18	47	14	104	28	94	13
100	158	88	82	38	168	140	18	57	14	120	30	113	14

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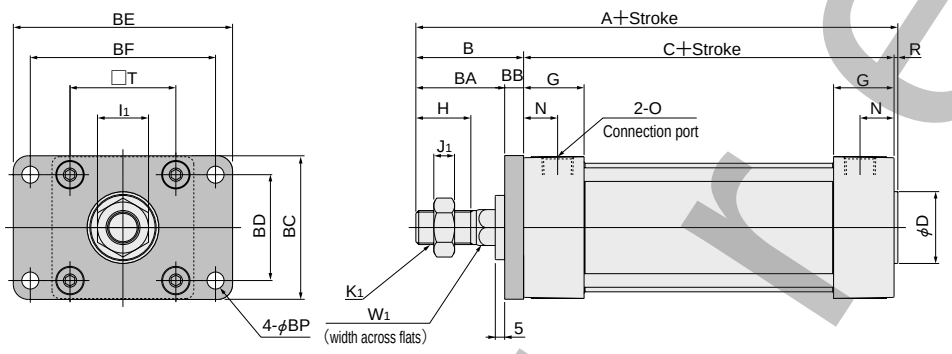
Dimensions of Rod Side Flange Mounting Type (Unit mm)

DDAL Bore size × Stroke **-3**

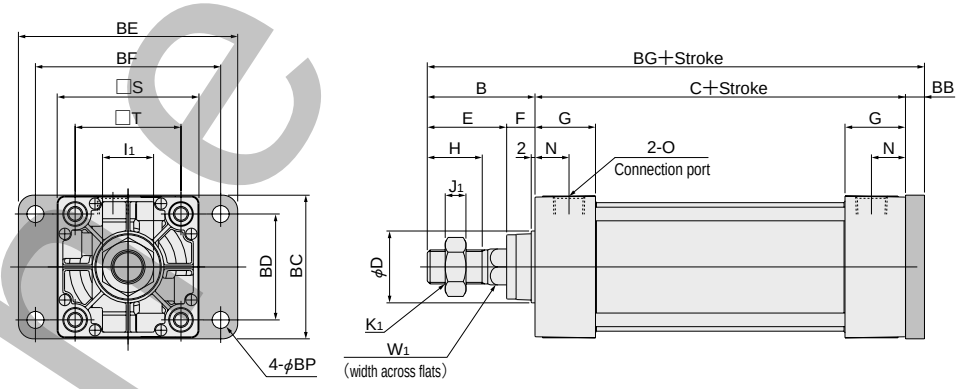


Bore size \ Code	A	B	C	D	G	H	I_1	J_1	K_1	N	O	R	T	W_1
40	144	49	93	32	31	21	19	7	M12×1.25	18	Rc1/4	2	37	14
50	152	57	93	38	31	29	27	11	M18×1.5	18	Rc3/8	2	47	19
63	155	57	96	38	32	29	27	11	M18×1.5	18	Rc3/8	2	56	19
80	185	75	108	44	36	37	32	13	M22×1.5	20	Rc1/2	2	70	23
100	185	75	108	50	36	37	32	13	M22×1.5	20	Rc1/2	2	84	23

Bore size \ Code	BA	BB	BC	BD	BE	BF	BP
40	39	10	52	36	84	70	7
50	47	10	65	47	104	86	9
63	47	10	76	56	116	98	9
80	59	16	95	70	143	119	12
100	59	16	115	84	162	138	12

Dimensions of Head Side Flange Mounting Type (Unit mm)

DDAL Bore size × Stroke **-5**



Bore size \ Code	B	C	D	E	F	G	H	I_1	J_1	K_1	N	O	S	T	W_1
40	49	93	32	34	15	31	21	19	7	M12×1.25	18	Rc1/4	50	37	14
50	57	93	38	42	15	31	29	27	11	M18×1.5	18	Rc3/8	62	47	19
63	57	96	38	42	15	32	29	27	11	M18×1.5	18	Rc3/8	75	56	19
80	75	108	44	54	21	36	37	32	13	M22×1.5	20	Rc1/2	94	70	23
100	75	108	50	54	21	36	37	32	13	M22×1.5	20	Rc1/2	112	84	23

Bore size \ Code	BB	BC	BD	BE	BF	BG	BP
40	10	52	36	84	70	152	7
50	10	65	47	104	86	160	9
63	10	76	56	116	98	163	9
80	16	95	70	143	119	199	12
100	16	115	84	162	138	199	12

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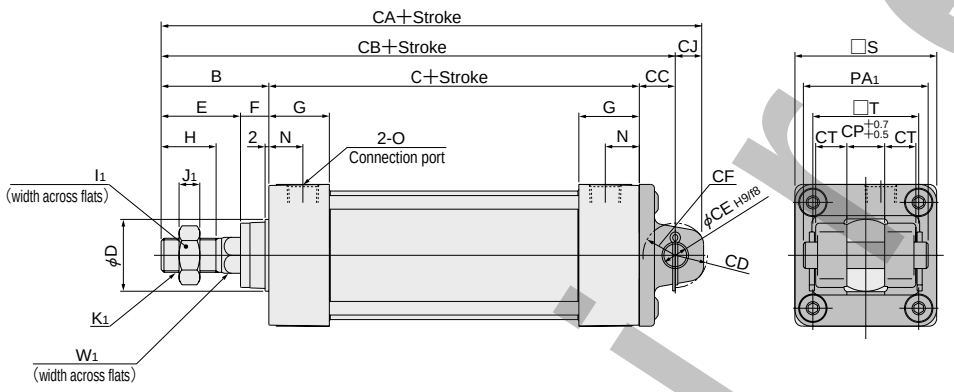
Dimensions of Clevis Mounting Type (Unit mm)

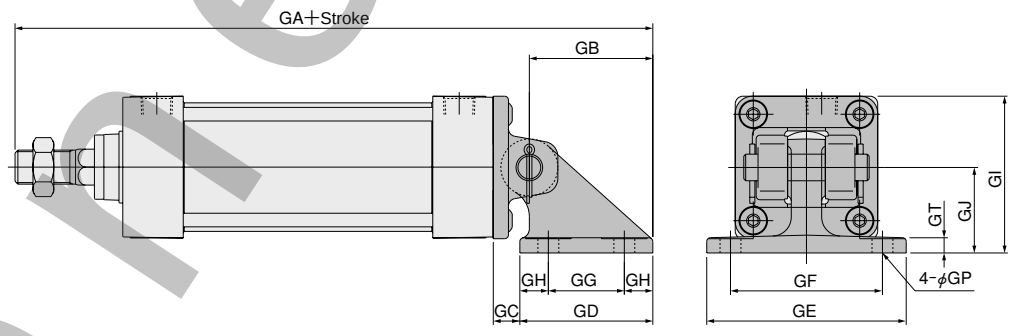
DDAL Bore size × Stroke **-7**



Bore size \ Code	B	C	D	E	F	G	H	l_1	J_1	K_1	N	O	S	T	W_1
40	49	93	32	34	15	31	21	19	7	M12×1.25	18	Rc1/4	50	37	14
50	57	93	38	42	15	31	29	27	11	M18×1.5	18	Rc3/8	62	47	19
63	57	96	38	42	15	32	29	27	11	M18×1.5	18	Rc3/8	75	56	19
80	75	108	44	54	21	36	37	32	13	M22×1.5	20	Rc1/2	94	70	23
100	75	108	50	54	21	36	37	32	13	M22×1.5	20	Rc1/2	112	84	23

Bore size \ Code	CA	CB	CC	CD	CE	CF	CJ	CP	CT	PA_1
40	174	161	19	R15	14	R17	13	20	12.5	58
50	184	169	19	R17	14	R17	15	20	16.5	66
63	187	172	19	R17	14	R17	15	20	16.5	66
80	236	215	32	R24	20	R30	21	32	17.5	78
100	236	215	32	R24	20	R30	21	32	17.5	78

●With Supporting Bracket DDAL Bore size × Stroke **-7-7C**



Bore size \ Code	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GP	GT
40	227.5	66.5	12.5	73	105	80	40	16.5	70	45	11(Thru hole)	8
50	235.5	66.5	12.5	73	105	80	40	16.5	76	45	11(Thru hole)	8
63	238.5	66.5	12.5	73	105	80	40	16.5	82.5	45	11(Thru hole)	8
80	301.5	86.5	20.5	98	135	105	65	16.5	107	60	14(Thru hole)	12
100	301.5	86.5	20.5	98	135	105	65	16.5	116	60	14(Thru hole)	12

Preview

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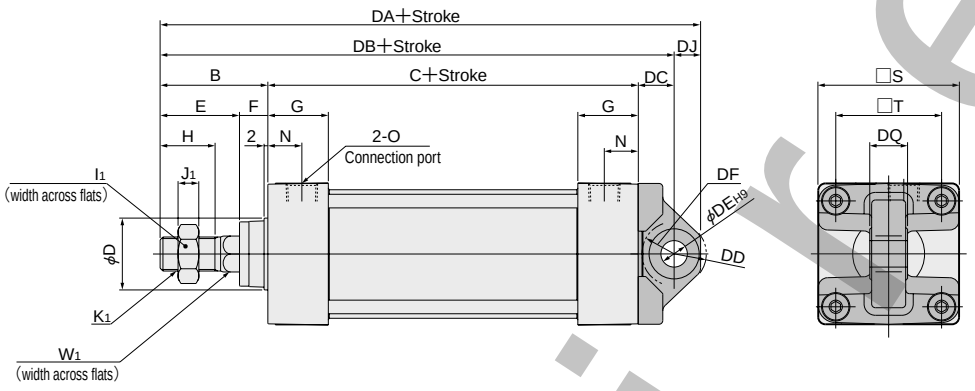
Dimensions of Pivot Mounting Type (Unit mm)

DDAL Bore size × Stroke **-8**



Bore size \ Code	B	C	D	E	F	G	H	I_1	J_1	K_1	N	O	S	T	W_1
40	49	93	32	34	15	31	21	19	7	M12×1.25	18	Rc1/4	50	37	14
50	57	93	38	42	15	31	29	27	11	M18×1.5	18	Rc3/8	62	47	19
63	57	96	38	42	15	32	29	27	11	M18×1.5	18	Rc3/8	75	56	19
80	75	108	44	54	21	36	37	32	13	M22×1.5	20	Rc1/2	94	70	23
100	75	108	50	54	21	36	37	32	13	M22×1.5	20	Rc1/2	112	84	23

Bore size \ Code	DA	DB	DC	DD	DE	DF	DJ	DQ
40	175	161	19	R17	14	R17	14	$20\ ^{0}_{-0.084}$
50	183	169	19	R17	14	R17	14	$20\ ^{0}_{-0.084}$
63	186	172	19	R17	14	R17	14	$20\ ^{0}_{-0.084}$
80	236	215	32	R24	20	R25	21	$32\ ^{0}_{-0.100}$
100	235	215	32	R24	20	R26	20	$32\ ^{0}_{-0.100}$

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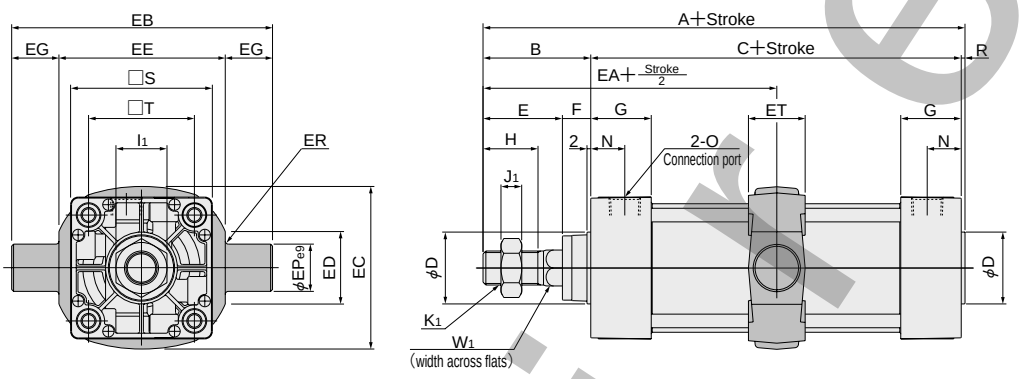
Dimensions of Trunnion Type (Unit mm)

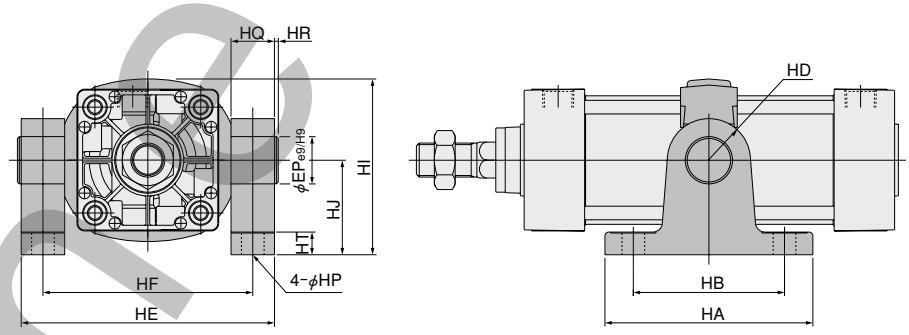
DDAL Bore size × Stroke **-11**



Code / Bore size	A	B	C	D	E	F	G	H	l_1	J_1	K_1	N	O	R	S	T	W_1
40	144	49	93	32	34	15	31	21	19	7	M12×1.25	18	Rc1/4	2	50	37	14
50	152	57	93	38	42	15	31	29	27	11	M18×1.5	18	Rc3/8	2	62	47	19
63	155	57	96	38	42	15	32	29	27	11	M18×1.5	18	Rc3/8	2	75	56	19
80	185	75	108	44	54	21	36	37	32	13	M22×1.5	20	Rc1/2	2	94	70	23
100	185	75	108	50	54	21	36	37	32	13	M22×1.5	20	Rc1/2	2	112	84	23

Code / Bore size	EA	EB	EC	ED	EE	EG	EP	ER	ET
40	95.5	113	60	30	63	25	25	R1.6	30
50	103.5	126	72	30	76	25	25	R1.6	30
63	105	138	87	40	88	25	25	R1.6	30
80	129	164	105	40	114	25	25	R1.6	35
100	129	182	129	44	132	25	25	R2	40

●**With Supporting Bracket** **DDAL** Bore size × Stroke **-11-11T**



Code / Bore size	HA	HB	HD	HE	HF	HI	HJ	HP	HQ	HR	HT	EP
40	111	80	R22	109	86	80	50	12(Thru hole)	23	2	14	25
50	111	80	R22	122	99	86	50	12(Thru hole)	23	2	14	25
63	111	80	R22	134	111	93.5	50	12(Thru hole)	23	2	14	25
80	121	85	R22	160	137	122.5	70	14(Thru hole)	23	2	14	25
100	121	85	R22	178	155	134.5	70	14(Thru hole)	23	2	14	25

preview

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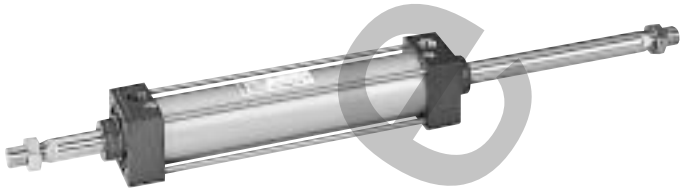
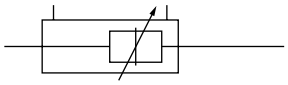
NEW DYNA Double Rod Cylinders



Symbol



Specifications

Item \ Bore size mm	32	40	50	63	80	100	125
Operating method	Double acting type						
Media	Air						
Mounting type	Basic type, Foot mounting type, Axis right angled foot mounting type, Flange mounting type, Trunnion type						
Operating pressure range MPa {kgf/cm²}	0.1～1.0 {1.0～10.2}						
Proof pressure MPa {kgf/cm²}	1.5 {15.3}						
Operating temperature range °C	—10～70 (Freezing not allowed, with sensor is 0～60.)						
Operating speed range mm/s	50～800	50～700					
Cushion	Variable cushion at both ends of stroke						
Cushion stroke mm	16		20		25		
Lubrication	Not required (But if you must use lubrication, use Turbine Oil No.1〔ISO VG32〕or equivalent)						
Port size Rc	1/8	1/4	3/8		1/2		

Bore size and Stroke

mm

Bore sizer	Standard stroke	Maximum potential manufacturing stroke
32	50、75、100、150、200、250、300、350、400、450、500	500
40	50、75、100、150、200、250、300、350、400、450、500 600、700、800	800
50		
63		
80	50、75、100、150、200、250、300、350、400、450、500 600、700、800、900、1000	1000
100		
125		

Remarks : 1. Stroke tolerance: Strokes of 250 or less are $^{+1}_{0}$, strokes of 251 ～1000 are $^{+1.5}_{0}$.
2. For non-standard strokes, consult us.
3. For the maximum potential manufacturing stroke with bellows specification, see p.104.

Order Code

DDA □ **50×100** – □ – □ – □ – [ ] □ □

Bore size × Stroke

Cylinder specification
D —— Double rod cylinders
DJ —— Double rod cylinders with bellows

Types of bellows
JT —— Nylon tarpaulin (～80˚C)
JC —— Chloroprene (～100˚C)
JK —— Cornex (～200˚C)
JA —— Arumix (～250˚C)
●Attached on both sides
●Cornex is a registered trademark of Teijin, Inc.
●The temperature shown is the bellows own durable temperature, and is not a temperature for cylinder use.

NEW DYNA Cylinders Basic model

Mounting type
Blank — Basic type
1 —— Foot mounting type
2 —— Axis right angled foot mounting type
3 —— Flange mounting type
11 —— Trunnion type
11-11T — Trunnion type (with supporting bracket)
●Mounting brackets are included at time of delivery, with the exception of the trunnion type.
●Orders for mounting brackets only are also accepted.

Sensor switch (for cylinder with magnet)

ZC130	2-lead wires	Solid state type	with indicator lamp	DC10～28V
ZC153	3-lead wires	Solid state type	with indicator lamp	DC4.5～28V
CS5T	2-lead wires	Reed switch type	without indicator lamp	DC5～28V, AC85～115V
CS11T	2-lead wires	Reed switch type	with indicator lamp	DC10～28V
CS2F	DIN type	Reed switch type	with indicator lamp	AC85～230V
CS3F	DIN type	Reed switch type	with indicator lamp	DC10～30V
CS4F	DIN type	Reed switch type	with indicator lamp	DC10～30V
CS5F	DIN type	Reed switch type	without indicator lamp	DC3～30V

●For sensor switch specifications, see p.97, while for mountings, see p.101.
●**CS□F** comes with a DIN connector. All others are grommet type.
●Orders for sensor switches only are also accepted.

Rod end mounting
Blank — Without rod end mounting
Y —— With Y type knuckle (with pin)
I —— With I type knuckle
●Rod end mounting are included at time of delivery. If required for both sides, place separate orders. For order code example, see p.104.
●Place separate orders for the cylinder joint and cylinder rod end.
●Orders for rod end mountings only are also accepted.
●For rod end mountings dimensions, see p.105.

Lead wire length
(Applicable to **ZC,CS□T type**)
A : 1000mm
B : 3000mm

Number of sensor switches
1 —— With one sensor switch
2 —— With two sensor switches
⋮ ⋮
n —— With n sensor switches

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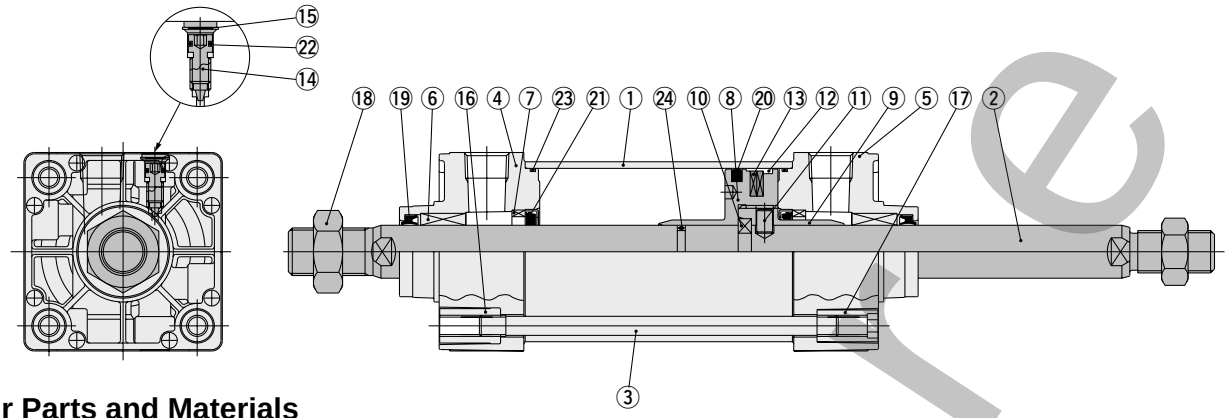
Inner Construction and Major Parts



Major Parts and Materials

No.	Parts	Materials
①	Cylinder tube	Aluminum alloy
②	Piston rod	ϕ32:Stainless steel, ϕ40～ϕ125:Carbon steel for machine structural use
③	Tie rod	Carbon steel for machine structural use
④	Rod cover	Aluminum die-cast
⑤	Rod cover D	Aluminum die-cast
⑥	Rod bushing	Oil-permeated sintered copper alloy
⑦	Keep ring	Aluminum alloy
⑧	Piston A	Aluminum alloy
⑨	Cushion ring D[Note 1]	Aluminum alloy
⑩	Split ring	Carbon steel for machine structural use
⑪	Pin	Carbon steel for machine structural use
⑫	Wear ring	Plastic
⑬	Magnet	Rubber magnet
⑭	Cushion needle	Carbon steel for machine structural use
⑮	Snap ring	Spring steel
⑯	Tie rod nut R	Rolled steel for general structural use

No.	Parts	Materials
⑰	Tie rod nut H	Chrome-molybdenum steel
⑱	Rod end nut	Rolled steel for general structural use
⑲	Rod seal	Synthetic rubber (NBR)
⑳	Piston seal	Synthetic rubber (NBR)
㉑	Cushion seal	Synthetic rubber (NBR)
㉒	Cushion gasket	Synthetic rubber (NBR)
㉓	Tube gasket	Synthetic rubber (NBR)
㉔	Piston gasket	Synthetic rubber (NBR)
—	Foot bracket	Rolled steel for general structural use
—	Axial right angled foot bracket	Cast iron
—	Flange mounting bracket	Rolled steel for general structural use
—	Trunnion bracket	Cast iron
—	Trunnion supporting bracket	Cast iron
—	Knuckles	Cast iron [Note 2]

Notes: 1. Piston B for ϕ32～ϕ50, cushion ring D for ϕ63～ϕ125.
2: The I knuckle for only ϕ125, is carbon steel for machine structural use.

Seals

Parts	Rod seal	Piston seal	Cushion seal	Tube gasket	Piston gasket	Cushion gasket
Bore size mm / Quantity	2★	1★	2	2★	1	2
32	DRP12	PWP32N	CPF15	1.5×32	P9	S5
40	DRP16	PWP40N	CPF20	1.5×40	P12	S5
50	DRP20	PWP50N	CPF24	1.5×50	P16	S6
63	DRP20	PWP63N	CPF24	1.5×63	P16	S6
80	DRP25	PWP80N	CPF30	1.5×80	P21	S6
100	DRP30	PWP100N	CPF35	1.5×100	G25	S6
125	DRP35	PWP125N	CPF45	1.5×125	G30	S7

Remark: Starred ★ designate items available as repair kits.
Order code
For standard cylinders･･･**SRK-NDDA** Bore size
Note that the repair kit content consists of one rod seal, one piston seal, and two cylinder tube gaskets.

Mass

kg

Bore size mm	Mass at zero stroke						Additional mass for each 1mm stroke	Mass of one sensor switch [with holder]		Mass of knuckle	
	Basic type	Foot mounting type	Axial perpendicular foot mounting type	Flange mounting type	Trunnion type	Trunnion type (with supporting bracket)		ZC□□□ CS□T [Note]	CS□F	Y type knuckle (with pin)	I type knuckle
32	0.68	0.79	0.82	0.88	0.98	1.20	0.00306	0.04	0.05	0.22	0.16
40	0.84	0.97	1.04	1.21	1.32	1.82	0.00457			0.27	0.16
50	1.35	1.52	1.67	1.74	1.90	2.40	0.00673			0.34	0.21
63	1.86	2.09	2.38	2.39	2.56	3.06	0.00760	0.04	0.06	0.34	0.21
80	3.16	3.54	4.01	4.76	4.32	5.04	0.01217			0.87	0.62
100	4.22	4.69	5.50	6.44	5.75	6.47	0.01612			1.47	1.24
125	9.48	9.95	10.86	12.35	12.89	14.44	0.02240	0.046	0.066	1.47	1.24

Note: For lead wire length A (1000mm).

Calculation example: For a foot mounting type with bore size of 50mm, and a 100mm stroke 1.52＋(0.00673×100)＝2.193kg

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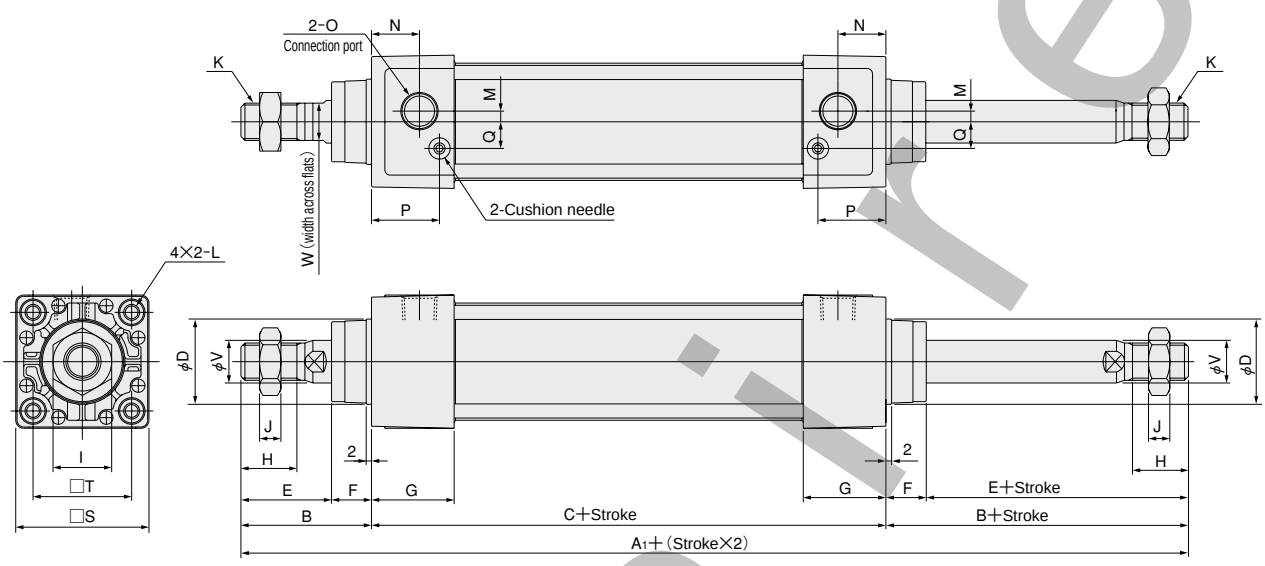
Dimensions of Basic Type (Unit mm)

DDAD Bore size × Stroke



Code / Bore size	A_1	B	C	D	E	F	G	H	I	J	K	L
32	187	47	93	26	32	15	31	19	17	6	M10×1.25	M 6×1 Depth 14
40	191	49	93	32	34	15	31	21	22	8	M14×1.5	M 6×1 Depth 14
50	207	57	93	38	42	15	31	29	27	11	M18×1.5	M 6×1 Depth 14
63	210	57	96	38	42	15	32	29	27	11	M18×1.5	M 8×1.25 Depth 14
80	258	75	108	44	54	21	36	37	32	13	M22×1.5	M10×1.5 Depth 15
100	258	75	108	50	54	21	36	37	36	14	M26×1.5	M10×1.5 Depth 15
125	292	89	114	60	68	21	36	50	36	16	M27×2	M12×1.75 Depth 15

Code / Bore size	M	N	O	P	Q	S	T	V	W
32	3	16	Rc1/8	25.5	7	44	33	12	10
40	4	18	Rc1/4	25.5	10	50	37	16	14
50	7	18	Rc3/8	24	12	62	47	20	17
63	8	18	Rc3/8	25	12	75	56	20	17
80	11	20	Rc1/2	29	16	94	70	25	21
100	12	20	Rc1/2	29	18	112	84	30	26
125	14	20	Rc1/2	29	20	136	104	35	32

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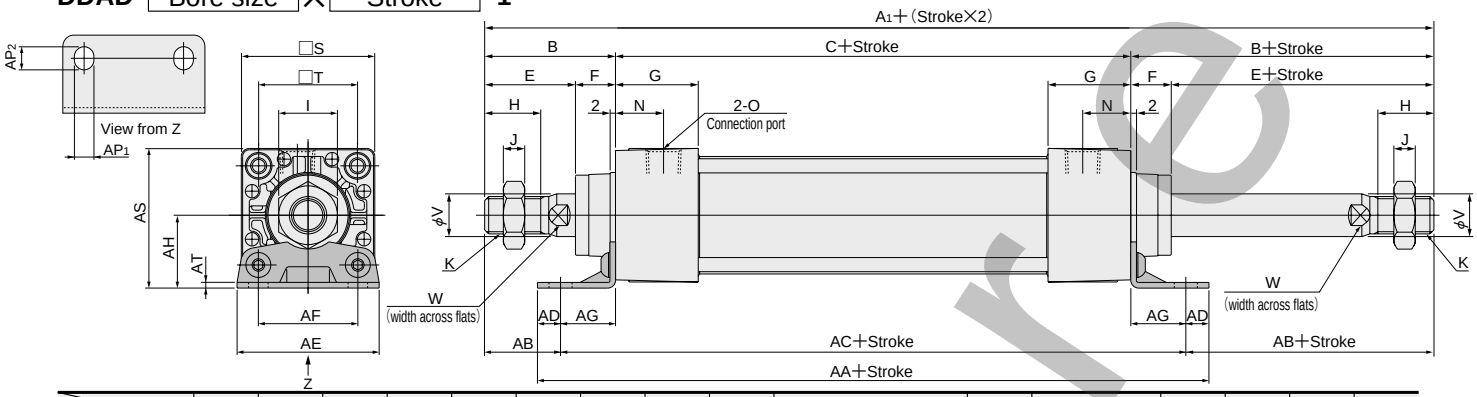
Dimensions of Foot Mounting Type (Unit mm)

DDAD Bore size × Stroke **-1**

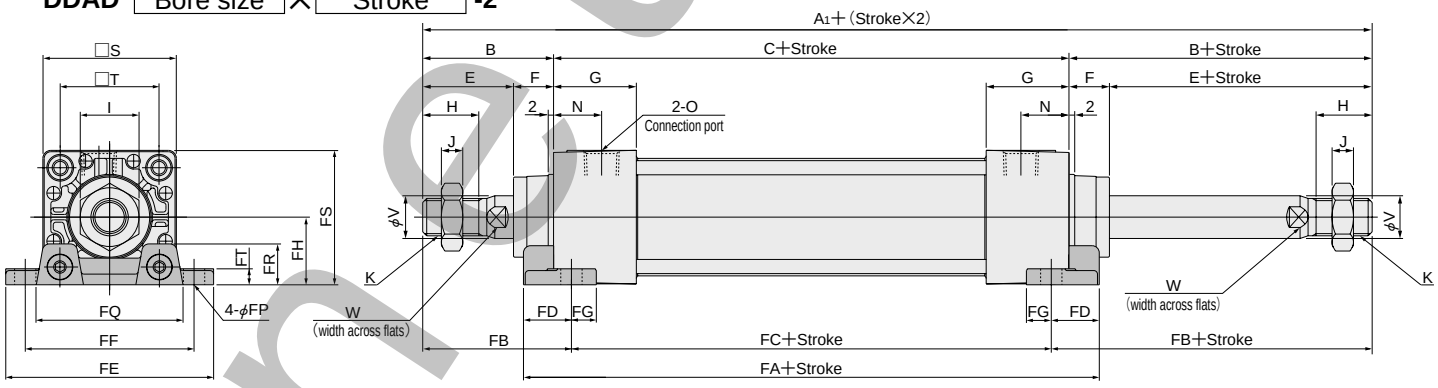


Bore size \ Code	A1	B	C	E	F	G	H	I	J	K	N	O	S	T	V	W
32	187	47	93	32	15	31	19	17	6	M10×1.25	16	Rc1/8	44	33	12	10
40	191	49	93	34	15	31	21	22	8	M14×1.5	18	Rc1/4	50	37	16	14
50	207	57	93	42	15	31	29	27	11	M18×1.5	18	Rc3/8	62	47	20	17
63	210	57	96	42	15	32	29	27	11	M18×1.5	18	Rc3/8	75	56	20	17
80	258	75	108	54	21	36	37	32	13	M22×1.5	20	Rc1/2	94	70	25	21
100	258	75	108	54	21	36	37	36	14	M26×1.5	20	Rc1/2	112	84	30	26
125	292	89	114	68	21	36	50	36	16	M27×2	20	Rc1/2	136	104	35	32

Bore size \ Code	AA	AB	AC	AD	AE	AF	AG	AH	AP1	AP2	AS	AT
32	153	26.5	134	9.5	50	33	20.5	28	9	11	50	3.2
40	165	25.5	140	12.5	57	36	23.5	30	11	13	55	3.2
50	173	29	149	12	68	47	28	36.5	11	13	67.5	3.2
63	184	26	158	13	80	56	31	41	11	13	78.5	3.2
80	200	45	168	16	97	70	30	49	14	16	96	4
100	200	45	168	16	112	84	30	57	14	16	113	4
125	220	54	184	18	136	104	35	70	18	20	138	6

Dimensions of Axis Right Angled Foot Mounting Type (Unit mm)

DDAD Bore size × Stroke **-2**



Bore size \ Code	A1	B	C	E	F	G	H	I	J	K	N	O	S	T	V	W
32	187	47	93	32	15	31	19	17	6	M10×1.25	16	Rc1/8	44	33	12	10
40	191	49	93	34	15	31	21	22	8	M14×1.5	18	Rc1/4	50	37	16	14
50	207	57	93	42	15	31	29	27	11	M18×1.5	18	Rc3/8	62	47	20	17
63	210	57	96	42	15	32	29	27	11	M18×1.5	18	Rc3/8	75	56	20	17
80	258	75	108	54	21	36	37	32	13	M22×1.5	20	Rc1/2	94	70	25	21
100	258	75	108	54	21	36	37	36	14	M26×1.5	20	Rc1/2	112	84	30	26
125	292	89	114	68	21	36	50	36	16	M27×2	20	Rc1/2	136	104	35	32

Bore size \ Code	FA	FB	FC	FD	FE	FF	FG	FH	FP	FQ	FR	FS	FT
32	119	57	73	23	81	63	14	22	9	54	14	44	8
40	119	59	73	23	92	70	14	25	12	58	16	50	8
50	123	67	73	25	105	83	14	31	12	68	17	62	9
63	130	67	76	27	117	95	14	38	12	84	22	75.5	9
80	150	88	82	34	147	121	18	47	14	104	28	94	13
100	158	88	82	38	168	140	18	57	14	120	30	113	14
125	172	106	80	46	213	175	21	69	18	144	35	137	18

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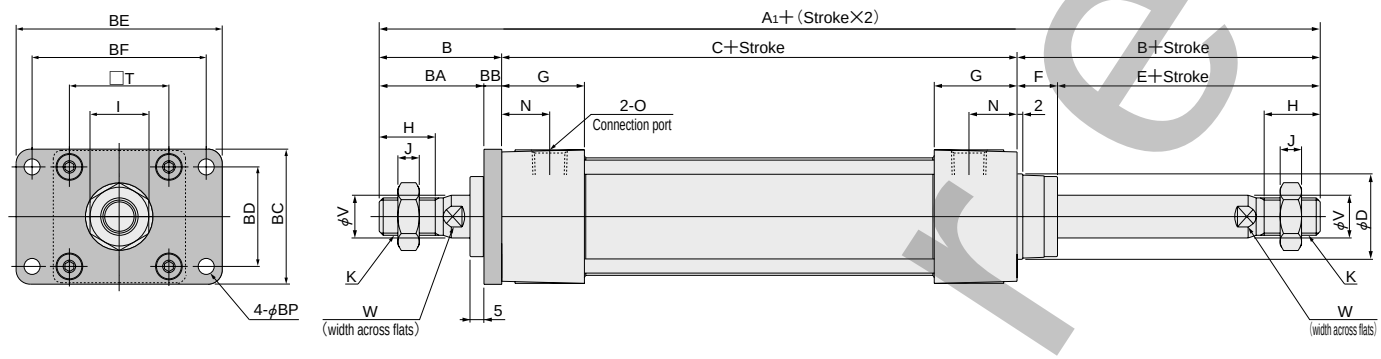
Dimensions of Flange Mounting Type (Unit mm)

DDAD Bore size × Stroke **-3**



Code / Bore size	A1	B	C	D	E	F	G	H	I	J	K	N	O	T	V	W
32	187	47	93	26	32	15	31	19	17	6	M10×1.25	16	Rc1/8	33	12	10
40	191	49	93	32	34	15	31	21	22	8	M14×1.5	18	Rc1/4	37	16	14
50	207	57	93	38	42	15	31	29	27	11	M18×1.5	18	Rc3/8	47	20	17
63	210	57	96	38	42	15	32	29	27	11	M18×1.5	18	Rc3/8	56	20	17
80	258	75	108	44	54	21	36	37	32	13	M22×1.5	20	Rc1/2	70	25	21
100	258	75	108	50	54	21	36	37	36	14	M26×1.5	20	Rc1/2	84	30	26
125	292	89	114	60	68	21	36	50	36	16	M27×2	20	Rc1/2	104	35	32

Code / Bore size	BA	BB	BC	BD	BE	BF	BP
32	37	10	47	33	72	58	7
40	39	10	52	36	84	70	7
50	47	10	65	47	104	86	9
63	47	10	76	56	116	98	9
80	59	16	95	70	143	119	12
100	59	16	115	84	162	138	12
125	73	16	138	104	196	168	14

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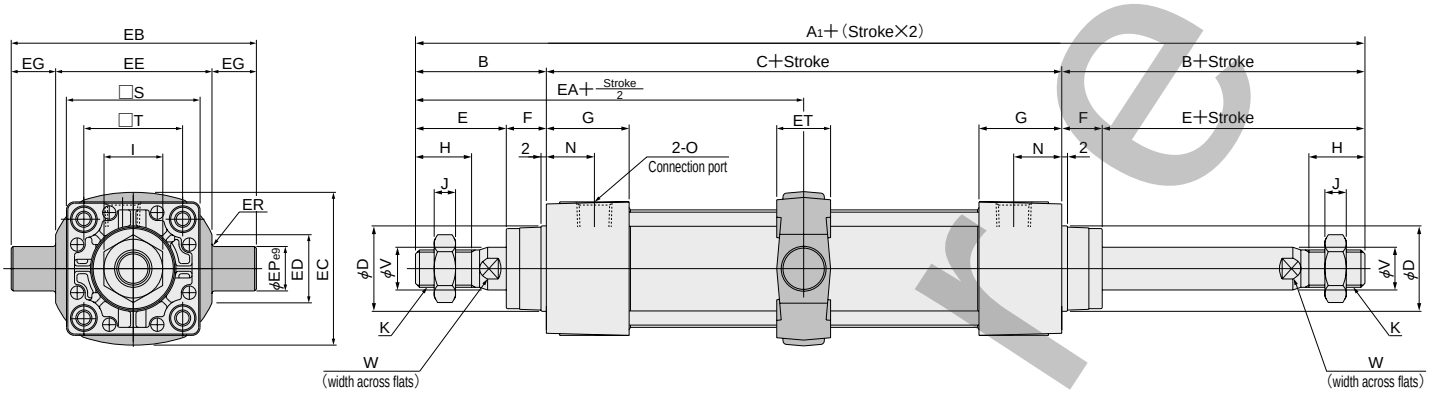
Dimensions of Trunnion Type (Unit mm)

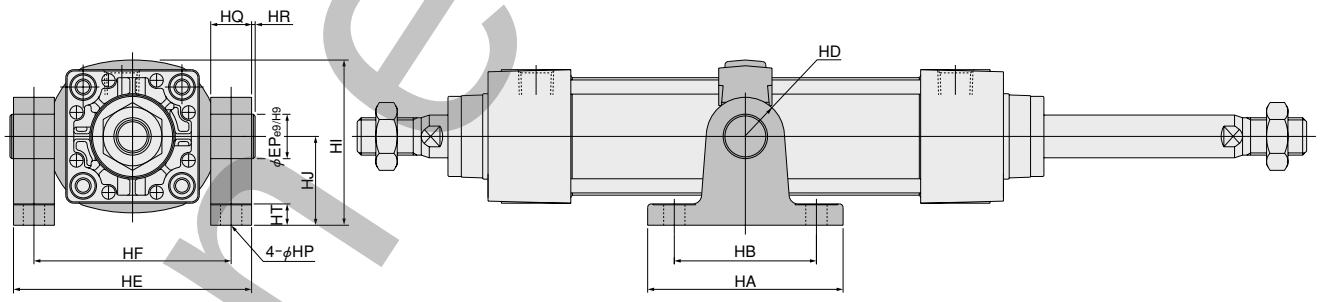
DDAD Bore size × Stroke **-11**



Bore size \ Code	A1	B	C	D	E	F	G	H	I	J	K	N	O	S	T	V	W
32	187	47	93	26	32	15	31	19	17	6	M10×1.25	16	Rc1/8	44	33	12	10
40	191	49	93	32	34	15	31	21	22	8	M14×1.5	18	Rc1/4	50	37	16	14
50	207	57	93	38	42	15	31	29	27	11	M18×1.5	18	Rc3/8	62	47	20	17
63	210	57	96	38	42	15	32	29	27	11	M18×1.5	18	Rc3/8	75	56	20	17
80	258	75	108	44	54	21	36	37	32	13	M22×1.5	20	Rc1/2	94	70	25	21
100	258	75	108	50	54	21	36	37	36	14	M26×1.5	20	Rc1/2	112	84	30	26
125	292	89	114	60	68	21	36	50	36	16	M27×2	20	Rc1/2	136	104	35	32

Bore size \ Code	EA	EB	EC	ED	EE	EG	EP	ER	ET
32	93.5	87	53	20	55	16	16	R1	30
40	95.5	113	60	30	63	25	25	R1.6	30
50	103.5	126	72	30	76	25	25	R1.6	30
63	105	138	87	40	88	25	25	R1.6	30
80	129	164	105	40	114	25	25	R1.6	35
100	129	182	129	44	132	25	25	R2	40
125	146	208	159	37.5	158	25	25	R2	43

●With Supporting Bracket DDAD Bore size × Stroke **-11-11T**



Bore size \ Code	HA	HB	HD	HE	HF	HI	HJ	HP	HQ	HR	HT	EP
32	81	60	R16	85	70	66.5	40	9(Thru hole)	15	1	12	16
40	111	80	R22	109	86	80	50	12(Thru hole)	23	2	14	25
50	111	80	R22	122	99	86	50	12(Thru hole)	23	2	14	25
63	111	80	R22	134	111	93.5	50	12(Thru hole)	23	2	14	25
80	121	85	R22	160	137	122.5	70	14(Thru hole)	23	2	14	25
100	121	85	R22	178	155	134.5	70	14(Thru hole)	23	2	14	25
125	145	105	R30	208	183	164.5	85	18(Thru hole)	25	0	27	25

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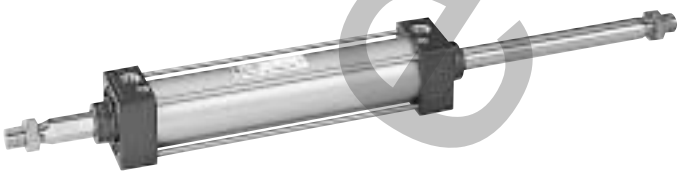
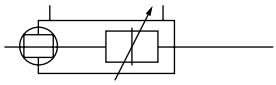
NEW DYNA Non-Rotating Double Rod Cylinders



Symbol



Specifications

Item \ Bore size mm	40	50	63	80	100
Operating method	Double acting type				
Media	Air				
Mounting type	Basic type, Foot mounting type, Axis right angled foot mounting type, Flange mounting type, Trunnion type				
Operating pressure range MPa {kgf/cm²}	0.15～1.0 {1.5～10.2}				
Proof pressure MPa {kgf/cm²}	1.5 {15.3}				
Operating temperature range °C	—10～70 (Freezing not allowed, with sensor is 0～60.)				
Operating speed range mm/s	50～500				
Cushion	Variable cushion at both ends of stroke				
Cushion stroke mm	16	20		25	
Lubrication	Not required (But if you must use lubrication, use Turbine oil Class 1〔ISO VG32〕or equivalent)				
Non-rotating accuracy	±1°	±0.8°		±0.5°	
Allowable torque N·m {kgf·m}	1 {0.1}	3.4 {0.35}		10 {1.02}	
Port size Rc	1/4	3/8		1/2	

Bore size and Stroke

mm

Bore sizer	Standard stroke	Maximum potential manufacturing stroke
40	50, 75, 100, 150, 200, 250, 300, 350, 400, 450, 500	500
50		
63		
80		
100		

Remarks : 1. Stroke tolerance: Strokes of 250 or less are $^{+1}_{0}$, strokes of 251 ～500 are $^{+1.5}_{0}$.
2. For non-standard strokes, consult us.
3. For the maximum potential manufacturing stroke with bellows specification, see p.104.

Order Code

DDA □ 50×100 – □ – □ – □ – □ – □ □ □

NEW DYNA Cylinders
Basic model

Cylinder specification
DL —— Non-rotating Double Rod Cylinders
DJL —— Non-rotating Double Rod Cylinders with bellows

Bore size
×
Stroke

Types of bellows
JT —— Nylon tarpaulin (～80˚C)
JC —— Chloroprene (～100˚C)
JK —— Cornex (～200˚C)
JA —— Arumix (～250˚C)
●Cornex is a registered trademark of Teijin, Inc.
●The temperature shown is the bellows own durable temperature, and is not a temperature for cylinder use.

Tube material
Blank — Standard (Aluminum tube)
FT —— Steel tube specification (Not available for cylinder with magnet.)

Mounting type
Blank — Basic type
1 —— Foot mounting type
2 —— Axis right angled foot mounting type
3 —— Flange mounting type
11 —— Trunnion type
11-11T — Trunnion type (with supporting bracket)
●Mounting brackets are included at time of delivery, with the exception of the trunnion type.
●Orders for mounting brackets only are also accepted.

Sensor switch (for cylinder with magnet)

ZC130 —	2-lead wires	Solid state type	with indicator lamp	DC10～28V
ZC153 —	3-lead wires	Solid state type	with indicator lamp	DC4.5～28V
CS5T —	2-lead wires	Reed switch type	without indicator lamp	DC5～28V, AC85～115V
CS11T —	2-lead wires	Reed switch type	with indicator lamp	DC10～28V
CS2F —	DIN type	Reed switch type	with indicator lamp	AC85～230V
CS3F —	DIN type	Reed switch type	with indicator lamp	DC10～30V
CS4F —	DIN type	Reed switch type	with indicator lamp	DC10～30V
CS5F —	DIN type	Reed switch type	without indicator lamp	DC3～30V

●For sensor switch specifications, see p.97, while for mountings, see p.101.
●**CS□F** comes with a DIN connector. All others are grommet type.
●Orders for sensor switches only are also accepted.

Lead wire length
(Applicable to **ZC,CS□T type**)
A : 1000mm
B : 3000mm

Number of sensor switches
1 —— With one sensor switch
2 —— With two sensor switches
⋮ ⋮
n —— With n sensor switches

Rod end mounting
Blank — Without rod end mounting
Y —— With Y type knuckle (with pin)
I —— With I type knuckle
●Rod end mountings are included at time of delivery. If required for both sides, place separate orders. For order code example, see p.104.
●Place separate orders for the cylinder joint and cylinder rod end.
●Orders rod end mountings only are also accepted.
●For rod end mountings dimensions, see p.105.

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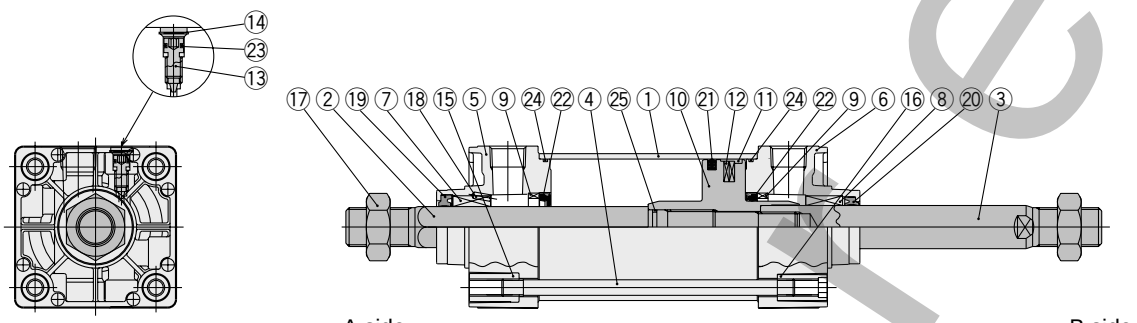
Inner Construction and Major Parts



Major Parts and Materials

No.	Parts	Materials
①	Cylinder tube	Aluminum alloy, and steel tube specifications are high carbon steel
②	Piston rod A	Carbon steel for machine structural use
③	Piston rod B	Carbon steel for machine structural use
④	Tie rod	Carbon steel for machine structural use
⑤	Rod cover A	Aluminum die-cast
⑥	Rod cover B	Aluminum die-cast
⑦	Rod bushing A	Aluminum alloy
⑧	Rod bushing B	Oil-permeated sintered copper alloy
⑨	Keep ring	Aluminum alloy
⑩	Piston	Aluminum alloy
⑪	Wear ring	Plastic
⑫	Magnet	Rubber magnet

No.	Parts	Materials
⑬	Cushion needle	Carbon steel for machine structural use
⑭	Snap ring	Spring steel
⑮	Tie rod nut R	Rolled steel for general structural use
⑯	Tie rod nut H	Chrome-molybdenum steel
⑰	Rod end nut	Rolled steel for general structural use
⑱	Spring pin	Carbon steel for machine structural use
⑲	Rod seal A	Urethane rubber
⑳	Rod seal B	Synthetic rubber (NBR)
㉑	Piston seal	Synthetic rubber (NBR)
㉒	Cushion seal	Synthetic rubber (NBR)
㉓	Cushion gasket	Synthetic rubber (NBR)
㉔	Tube gasket	Synthetic rubber (NBR)
㉕	Piston gasket	Synthetic rubber (NBR)

Seals

Parts / Bore size mm \ Quantity	Rod seal A	Rod seal B	Piston seal	Cushion seal	Tube gasket	Piston gasket	Cushion gasket
	1	1	1	2	2	1	2
40	PGR14A	DRP16	PWP40N	CPF20	1.5×40	S10	S5
50	PGR19	DRP20	PWP50N	CPF24	1.5×50	S14	S6
63	PGR19	DRP20	PWP63N	CPF24	1.5×63	S14	S6
80	PGR23	DRP25	PWP80N	CPF30	1.5×80	S18	S6
100	PGR23	DRP30	PWP100N	CPF35	1.5×100	S18	S6

Mass

kg

Bore size mm	Mass at zero stroke						Additional mass for each 1mm stroke	Mass of one sensor switch [with holder]		Mass of knuckle	
	Basic type	Foot mounting type	Axis right angled foot mounting type	Flange mounting type	Trunnion type	Trunnion type (with supporting bracket)		ZC□□□ CS□ T Note	CS□F	Y type knuckle (with pin)	I type knuckle
40	0.84 (0.88)	0.97 (1.01)	1.04 (1.08)	1.21 (1.25)	1.32 (1.36)	1.82 (1.86)	0.00433 (0.00564)	0.04	0.05	0.27	0.16
50	1.35 (1.41)	1.52 (1.58)	1.67 (1.73)	1.74 (1.80)	1.90 (1.96)	2.40 (2.46)	0.00670 (0.00877)			0.34	0.21
63	1.86 (1.94)	2.09 (2.17)	2.38 (2.46)	2.39 (2.47)	2.56 (2.64)	3.06 (3.14)	0.00757 (0.01015)	0.04	0.06	0.34	0.21
80	3.16 (3.33)	3.54 (3.71)	4.01 (4.18)	4.76 (4.93)	4.32 (4.49)	5.04 (5.21)	0.01193 (0.01661)			0.87	0.62
100	4.22 (4.43)	4.69 (4.90)	5.50 (5.71)	6.44 (6.65)	5.75 (5.96)	6.47 (6.68)	0.01420 (0.02001)			A side 0.87 B side 1.47	A side 0.62 B side 1.24

Note: For lead wire length A (1000mm).
Remarks: 1. Figures in parentheses ( ) are for steel tube specifications.
2. A side＝Non-rotating side

Calculation example: For a foot mounting type with bore size of 50mm, and a 100mm stroke 1.52＋(0.00670×100)＝2.19kg

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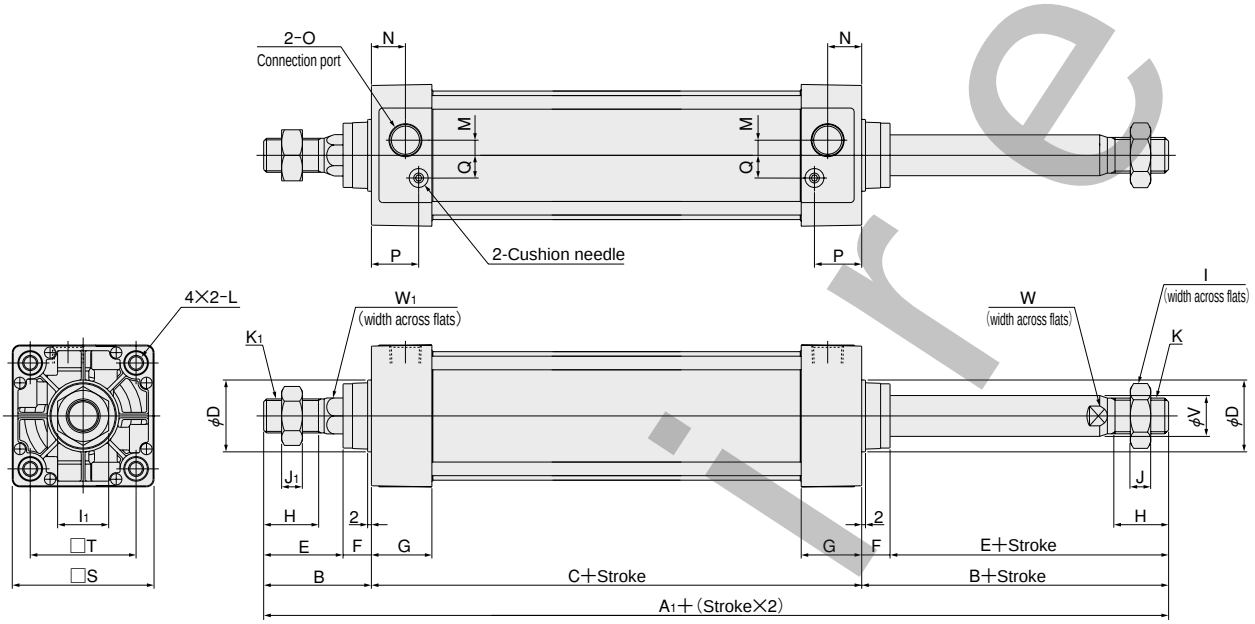
Dimensions of Basic Type (Unit mm)

DDADL Bore size × Stroke



Bore size \ Code	A1	B	C	D	E	F	G	H	I	I1	J	J1	K	K1
40	191	49	93	32	34	15	31	21	22	19	8	7	M14×1.5	M12×1.25
50	207	57	93	38	42	15	31	29	27	27	11	11	M18×1.5	M18×1.5
63	210	57	96	38	42	15	32	29	27	27	11	11	M18×1.5	M18×1.5
80	258	75	108	44	54	21	36	37	32	32	13	13	M22×1.5	M22×1.5
100	258	75	108	50	54	21	36	37	36	32	14	13	M26×1.5	M22×1.5

Bore size \ Code	L	M	N	O	P	Q	S	T	V	W	W1
40	M 6×1 Depth 14	4	18	Rc1/4	25.5	10	50	37	16	14	14
50	M 6×1 Depth 14	7	18	Rc3/8	24	12	62	47	20	17	19
63	M 8×1.25 Depth 14	8	18	Rc3/8	25	12	75	56	20	17	19
80	M10×1.5 Depth 15	11	20	Rc1/2	29	16	94	70	25	21	23
100	M10×1.5 Depth 15	12	20	Rc1/2	29	18	112	84	30	26	23

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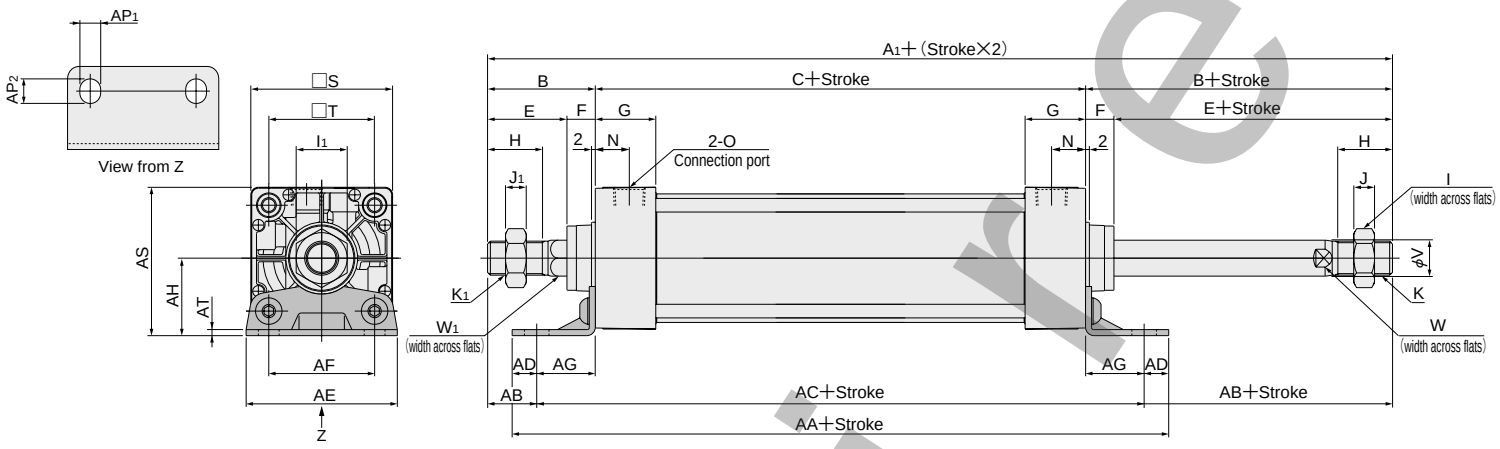
Dimensions of Foot Mounting Type (Unit mm)

DDADL Bore size × Stroke **-1**

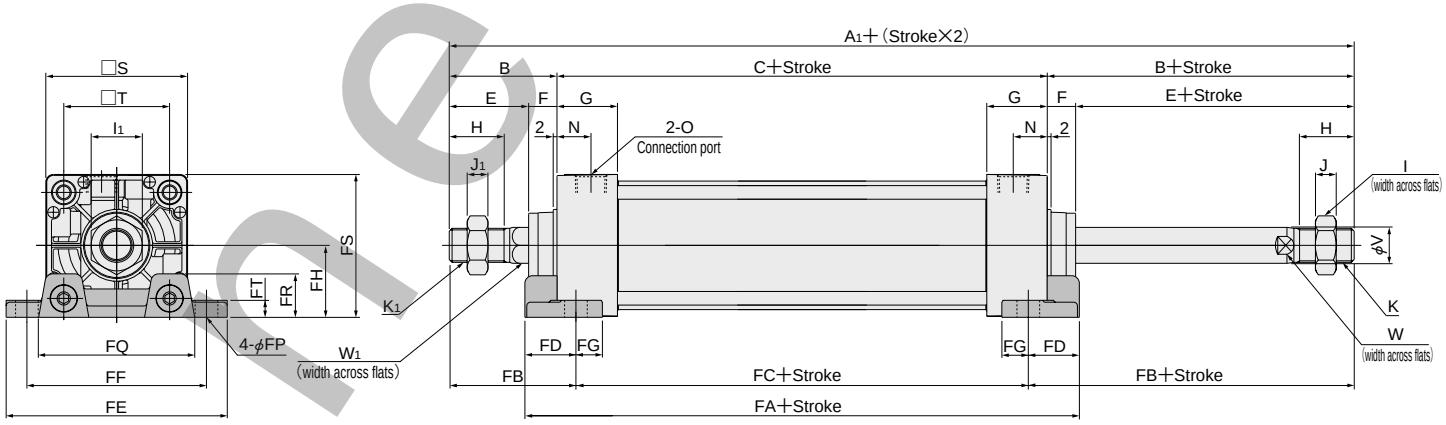


Bore size \ Code	A1	B	C	E	F	G	H	I	I1	J	J1	K	K1	N	O	S	T	V	W	W1
40	191	49	93	34	15	31	21	22	19	8	7	M14X1.5	M12X1.25	18	Rc1/4	50	37	16	14	14
50	207	57	93	42	15	31	29	27	27	11	11	M18X1.5	M18X1.5	18	Rc3/8	62	47	20	17	19
63	210	57	96	42	15	32	29	27	27	11	11	M18X1.5	M18X1.5	18	Rc3/8	75	56	20	17	19
80	258	75	108	54	21	36	37	32	32	13	13	M22X1.5	M22X1.5	20	Rc1/2	94	70	25	21	23
100	258	75	108	54	21	36	37	36	32	14	13	M26X1.5	M22X1.5	20	Rc1/2	112	84	30	26	23

Bore size \ Code	AA	AB	AC	AD	AE	AF	AG	AH	AP1	AP2	AS	AT
40	165	25.5	140	12.5	57	36	23.5	30	11	13	55	3.2
50	173	29	149	12	68	47	28	36.5	11	13	67.5	3.2
63	184	26	158	13	80	56	31	41	11	13	78.5	3.2
80	200	45	168	16	97	70	30	49	14	16	96	4
100	200	45	168	16	112	84	30	57	14	16	113	4

Dimensions of Axis Right Angled Foot Mounting Type (Unit mm)

DDADL Bore size × Stroke **-2**



Bore size \ Code	A1	B	C	E	F	G	H	I	I1	J	J1	K	K1	N	O	S	T	V	W	W1
40	191	49	93	34	15	31	21	22	19	8	7	M14X1.5	M12X1.25	18	Rc1/4	50	37	16	14	14
50	207	57	93	42	15	31	29	27	27	11	11	M18X1.5	M18X1.5	18	Rc3/8	62	47	20	17	19
63	210	57	96	42	15	32	29	27	27	11	11	M18X1.5	M18X1.5	18	Rc3/8	75	56	20	17	19
80	258	75	108	54	21	36	37	32	32	13	13	M22X1.5	M22X1.5	20	Rc1/2	94	70	25	21	23
100	258	75	108	54	21	36	37	36	32	14	13	M26X1.5	M22X1.5	20	Rc1/2	112	84	30	26	23

Bore size \ Code	FA	FB	FC	FD	FE	FF	FG	FH	FP	FQ	FR	FS	FT
40	119	59	73	23	92	70	14	25	12	58	16	50	8
50	123	67	73	25	105	83	14	31	12	68	17	62	9
63	130	67	76	27	117	95	14	38	12	84	22	75.5	9
80	150	88	82	34	147	121	18	47	14	104	28	94	13
100	158	88	82	38	168	140	18	57	14	120	30	113	14

Preview

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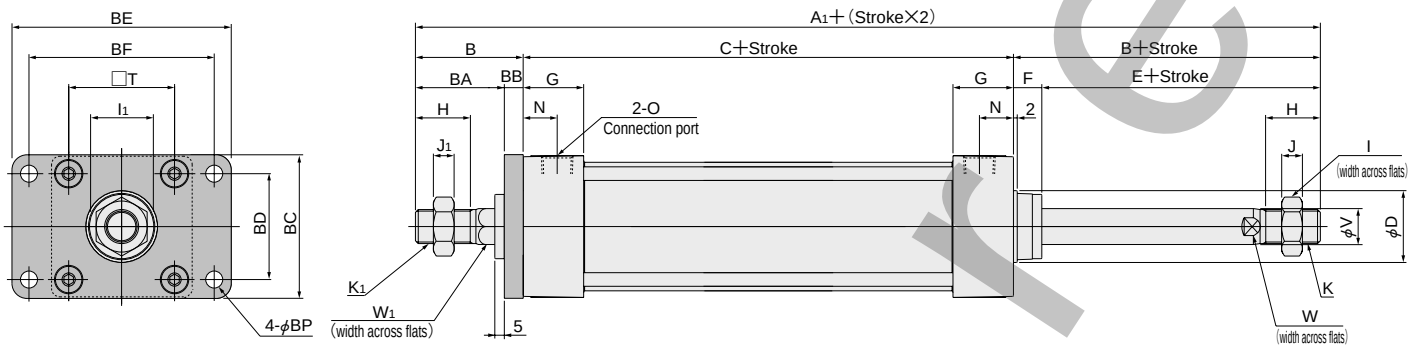
Dimensions of Flange Mounting Type (Unit mm)

DDADL Bore size × Stroke **-3**



Bore size \ Code	A1	B	C	D	E	F	G	H	I	I1	J	J1	K	K1	N	O	T	V	W	W1
40	191	49	93	32	34	15	31	21	22	19	8	7	M14×1.5	M12×1.25	18	Rc1/4	37	16	14	14
50	207	57	93	38	42	15	31	29	27	27	11	11	M18×1.5	M18×1.5	18	Rc3/8	47	20	17	19
63	210	57	96	38	42	15	32	29	27	27	11	11	M18×1.5	M18×1.5	18	Rc3/8	56	20	17	19
80	258	75	108	44	54	21	36	37	32	32	13	13	M22×1.5	M22×1.5	20	Rc1/2	70	25	21	23
100	258	75	108	50	54	21	36	37	36	32	14	13	M26×1.5	M22×1.5	20	Rc1/2	84	30	26	23

Bore size \ Code	BA	BB	BC	BD	BE	BF	BP
40	39	10	52	36	84	70	7
50	47	10	65	47	104	86	9
63	47	10	76	56	116	98	9
80	59	16	95	70	143	119	12
100	59	16	115	84	162	138	12

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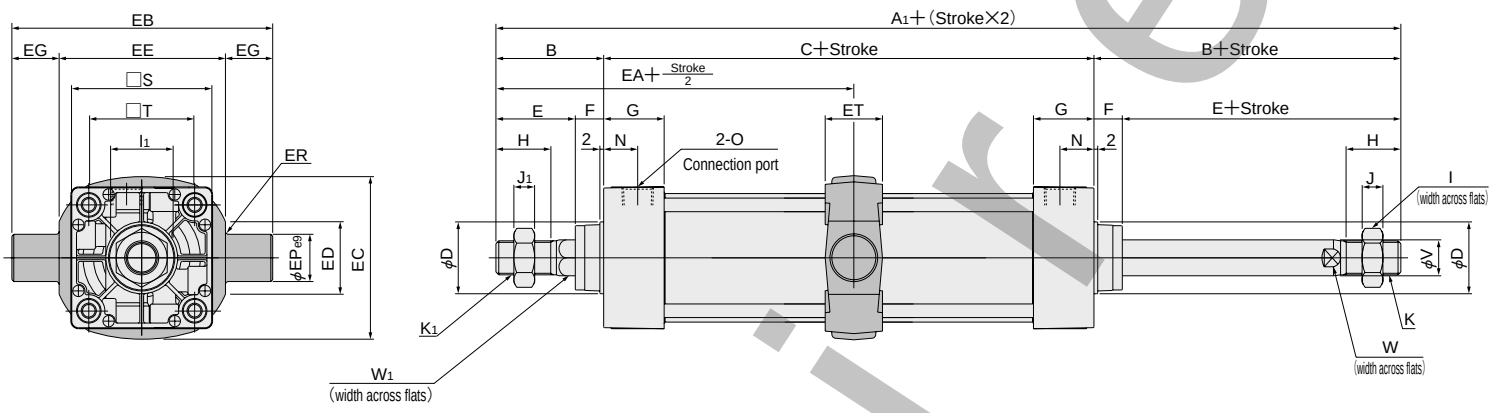
Dimensions of Trunnion Type (Unit mm)

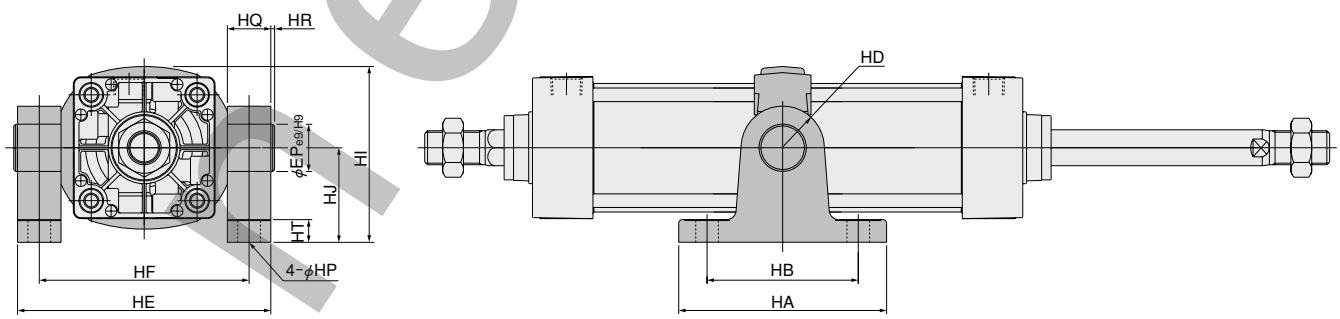
DDADL Bore size × Stroke **-7**



Bore size \ Code	A1	B	C	D	E	F	G	H	I	I1	J	J1	K	K1	N	O	S	T	V	W	W1
40	191	49	93	32	34	15	31	21	22	19	8	7	M14×1.5	M12×1.25	18	Rc1/4	50	37	16	14	14
50	207	57	93	38	42	15	31	29	27	27	11	11	M18×1.5	M18×1.5	18	Rc3/8	62	47	20	17	19
63	210	57	96	38	42	15	32	29	27	27	11	11	M18×1.5	M18×1.5	18	Rc3/8	75	56	20	17	19
80	258	75	108	44	54	21	36	37	32	32	13	13	M22×1.5	M22×1.5	20	Rc1/2	94	70	25	21	23
100	258	75	108	50	54	21	36	37	36	32	14	13	M26×1.5	M22×1.5	20	Rc1/2	112	84	30	26	23

Bore size \ Code	EA	EB	EC	ED	EE	EG	EP	ER	ET
40	95.5	113	60	30	63	25	25	R1.6	30
50	103.5	126	72	30	76	25	25	R1.6	30
63	105	138	87	40	88	25	25	R1.6	30
80	129	164	105	40	114	25	25	R1.6	35
100	129	182	129	44	132	25	25	R2	40

●With Supporting Bracket DDADL Bore size × Stroke **-7-7C**



Bore size \ Code	HA	HB	HD	HE	HF	HI	HJ	HP	HQ	HR	HT	EP
40	111	80	R22	109	86	80	50	12(Thru hole)	23	2	14	25
50	111	80	R22	122	99	86	50	12(Thru hole)	23	2	14	25
63	111	80	R22	134	111	93.5	50	12(Thru hole)	23	2	14	25
80	121	85	R22	160	137	122.5	70	14(Thru hole)	23	2	14	25
100	121	85	R22	178	155	134.5	70	14(Thru hole)	23	2	14	25

Preview

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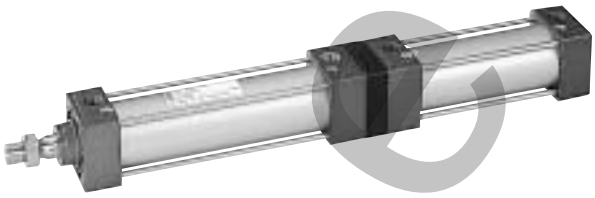
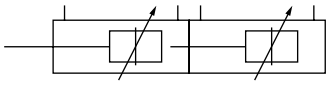
NEW DYNA Tandem Cylinders



Symbol



Specifications

Item \ Bore size mm	40	50	63	80	100
Operating method	Double acting type				
Media	Air				
Mounting type	Basic type, Foot mounting type, Axis right angled foot mounting type, Rod side flange mounting type, Head side flange mounting type, Clevis mounting type, Pivot mounting type, Trunnion type				
Operating pressure range MPa{kgf/cm²}	0.05～0.7 {0.5～7.1}				
Proof pressure MPa{kgf/cm²}	1.05 {10.7}				
Operating temperature range °C	—10～70 (Freezing not allowed, with sensor is 0～60.)				
Operating speed range mm/s	30～700				
Cushion	Variable cushion at both ends of stroke (applied to each cylinder)				
Cushion stroke mm	16	20		25	
Lubrication	Not required (But if you must use lubrication, use Turbine Oil No.1〔ISO VG32〕or equivalent)				
Port size Rc	1/4	3/8		1/2	

Bore size and Stroke

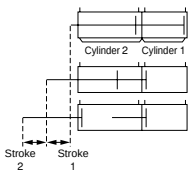
mm

Stroke 2	Bore size	Stroke1 50	75	100	150	200	250	300	350	400	Maximum potential manufacturing stroke (Stroke 1+stroke 2)
	40	0, 25, 50, 100 150, 200, 250 300, 350, 400	0, 25, 75, 125 175, 225, 275 325	0, 50, 100, 150 200, 250, 300	0, 50, 100, 150 200	0, 50, 100	0	—	—	—	800
	50•63	0, 25, 50, 100 150, 200, 250 300, 350, 400 450	0, 25, 75, 125 175, 225, 275 325, 375, 425	0, 50, 100, 150 200, 250, 300 350, 400	0, 50, 100, 150 200, 250, 300	0, 50, 100, 150 200	0, 50, 100	0	—	—	1000
	80•100	0, 25, 50, 100 150, 200, 250 300, 350, 400 450, 550, 650	0, 25, 75, 125 175, 225, 275 325, 375, 425 525, 625	0, 50, 100, 150 200, 250, 300 350, 400, 500 600	0, 50, 100, 150 200, 250, 300 350, 450	0, 50, 100, 150 200, 250, 300 400	0, 50, 100 150, 200 250	0, 50, 100 150, 200	0, 50 100	0	1000

Caution: Figures in the table are a combination of stroke 2 (standard) corresponding to stroke 1 (standard).

Remaks: 1. Stroke tolerance: Strokes of 250 or less are $^{+1}_{0}$, strokes of 251～1000 are $^{+1.5}_{0}$.
2. For non-standard strokes, consult us.
3. For the mximum potential manufacturing stroke with bellows specification, see p.104.

●Regarding stroke 1 and stroke 2



Stroke 1 is the stroke of cylinder 1.
Stroke 2 is stroke 1 subtracted from the stroke of cylinder 2.

Order Code

DDA □ **63×100×50** – □ – □ – □ – □ □ □

Bore size × Stroke1 × Stroke2

Types of bellows
JT — Nylon tarpaulin (～80˚C)
JC — Chloroprene (～100˚C)
JK — Cornex (～200˚C)
JA — Arumix (～250˚C)
●Cornex is a registered trademark of Teijin, Inc.
●The temperature shown is the bellows own durable temperature, and is not a temperature for cylinder use.

Cylinder specification
T — Tandem cylinders
JT — Tandem cylinders with bellows

NEW DYNA Cylinders
Basic model

Mounting type
Blank — Basic type
1 — Foot mounting type
2 — Axis right angled foot mounting type
3 — Rod side flange mounting type
5 — Head side flange mounting type
7 — Clevis mounting type (with pin)
7-7C — Clevis mounting type (with supporting brackets)
8 — Pivot mounting type
11 — Trunnion type
11-11T — Trunnion type (with supporting bracket)
●Mounting brackets are included at time of delivery, with the exception of the trunnion type.
●Orders for mounting brackets only are also accepted.

Sensor switch (for cylinder with magnet)

ZC130	2-lead wires	Solid state type	with indicator lamp	DC10～28V
ZC153	3-lead wires	Solid state type	with indicator lamp	DC4.5～28V
CS5T	2-lead wires	Reed switch type	without indicator lamp	DC5～28V, AC85～115V
CS11T	2-lead wires	Reed switch type	with indicator lamp	DC10～28V
CS2F	DIN type	Reed switch type	with indicator lamp	AC85～230V
CS3F	DIN type	Reed switch type	with indicator lamp	DC10～30V
CS4F	DIN type	Reed switch type	with indicator lamp	DC10～30V
CS5F	DIN type	Reed switch type	without indicator lamp	DC3～30V

●For sensor switch specifications, see p.97, while for mountings, see p.101.
●**CS□F** comes with a DIN connector. All others are grommet type.
●Orders for sensor switches only are also accepted.

Rod end mounting
Blank — Without rod end mounting
Y — With Y type knuckle (with pin)
I — With I type knuckle
●Place separate orders for the cylinder joint and cylinder rod end.
●Orders for tip fittings only are also accepted.
●For rod end mounting dimensions, see p.105.

Number of sensor switches
1 — With one sensor switch
2 — With two sensor switches
⋮ ⋮
n — With n sensor switches

Lead wire length
(Applicable to **ZC,CS□T type**)
A : 1000mm
B : 3000mm

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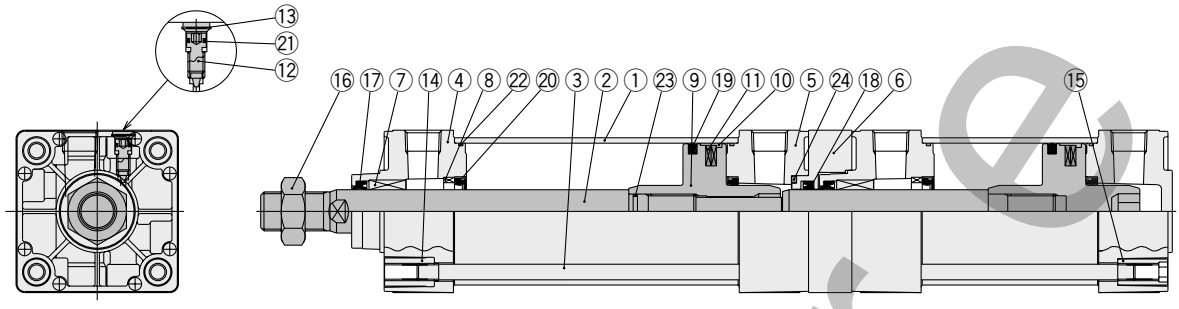
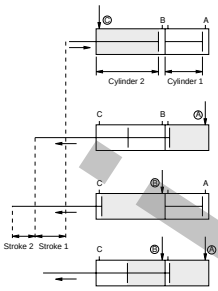
Inner Construction and Major Parts



●Explanation of tandem cylinder operation

The tandem cylinder combines two cylinders in- line.
It can be used as a two-step cylinder by supplying air to either port A or B, or it can obtain twice the thrust within the stroke 1.



Stroke 2 and stroke 1 are both retracted when air is supplied from port Ⓒ.

The rod moves stroke 1, when air is supplied from port Ⓐ.

The rod moves stroke 2, when air is supplied from port Ⓑ.

Doubled output is obtained before the end of stroke 1, when air is supplied from both ports Ⓐ and Ⓑ.

Major Parts and Materials

No.	Parts	Materials
①	Cylinder tube	Aluminum alloy
②	Piston rod	Carbon steel for machine structural use
③	Tie rod	Carbon steel for machine structural use
④	Rod cover	Aluminum die-cast
⑤	Head cover	Aluminum die-cast
⑥	Spacer	Aluminum alloy
⑦	Rod bushing	Oil-permeated sintered copper alloy
⑧	Keep ring	Aluminum alloy
⑨	Piston	Aluminum alloy
⑩	Wear ring	Plastic
⑪	Magnet	Rubber magnet
⑫	Cushion needle	Carbon steel for machine structural use
⑬	Snap ring	Spring steel
⑭	Tie rod nut R	Rolled steel for general structural use
⑮	Tie rod nut H	Chrome-molybdenum steel
⑯	Rod end nut	Rolled steel for general structural use

No.	Parts	Materials
⑰	Rod seal A	Synthetic rubber (NBR)
⑱	Rod seal B	Synthetic rubber (NBR)
⑲	Piston seal	Synthetic rubber (NBR)
⑳	Cushion seal	Synthetic rubber (NBR)
㉑	Cushion gasket	Synthetic rubber (NBR)
㉒	Tube gasket	Synthetic rubber (NBR)
㉓	Piston gasket	Synthetic rubber (NBR)
㉔	Spacer gasket	Synthetic rubber (NBR)
—	Foot bracket	Rolled steel for general structural use
—	Axial right angled foot bracket	Cast iron
—	Flange mounting bracket	Rolled steel for general structural use
—	Clevis mounting bracket	Cast iron
—	Clevis supporting bracket	Cast iron
—	Pivot bracket	Cast iron
—	Trunnion bracket	Cast iron
—	Trunnion supporting bracket	Cast iron
—	Knuckles	Cast iron

Seals

Parts / Bore size mm \ Quantity	Rod seal A	Rod seal B	Piston seal	Cushion seal	Tube gasket	Cushion gasket	Piston gasket	Spacer gasket
	2★	1★	2	4	4	4★	1	1
40	DRP16	PNU16	PWP40N	CPF20	1.5×40	S5	S10	S25
50	DRP20	PNU20	PWP50N	CPF24	1.5×50	S6	S14	G30
63	DRP20	PNU20	PWP63N	CPF24	1.5×63	S6	S14	G30
80	DRP25	PNU25	PWP80N	CPF30	1.5×80	S6	S18	G35
100	DRP30	PNU30	PWP100N	CPF35	1.5×100	S6	S18	G40

Remark: Starred ★ designate items available as repair kits.
Order code
SRK-NDDA Bore size
Note that the repair kit content consists of one rod seal, one piston seal, and two cylinder tube gaskets.

Mass

kg

Bore size mm	Mass at zero stroke									Additional mass for each 1mm stroke		Mass of one sensor switch [with holder]		Mass of knuckle	
	Basic type	Foot mounting type	Axis right angled foot mounting type	Flange mounting type	Clevis mounting type (with pin)	Clevis mounting type (with supporting bracket)	Pivot mounting type	Trunnion type	Trunnion type (with supporting bracket)	Stroke1	Stroke2	ZC□□□ CS□□T Note	CS□F	Y type knuckle (with pin)	I type knuckle
40	1.40	1.53	1.60	1.77	1.67	2.37	1.58	1.88	2.38	0.00300	0.00300	0.04	0.05	0.27	0.16
50	2.20	2.37	2.52	2.59	2.59	3.29	2.46	2.75	3.25	0.00428	0.00428			0.34	0.21
63	2.97	3.20	3.49	3.50	3.45	4.15	3.39	3.67	4.17	0.00515	0.00515	0.04	0.06	0.34	0.21
80	5.15	5.53	6.00	6.75	6.07	6.79	6.23	6.31	7.03	0.00834	0.00834			0.87	0.62
100	6.61	7.08	7.89	8.83	7.85	8.57	8.00	8.14	8.86	0.01061	0.01061			1.47	1.24

Note: For lead wire length A (1000mm).

Calculation example: For a foot mounting type with bore size of 50mm, and a 100mm stroke
2.37+(0.00428×100)+(0.00428×50)=3.012kg

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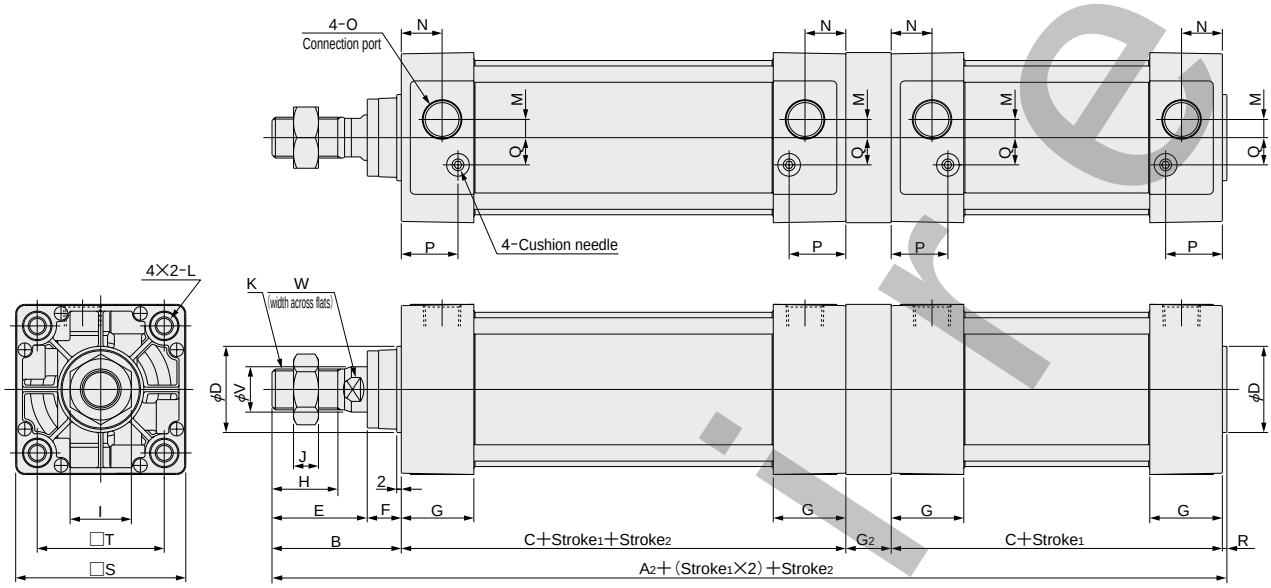
Dimensions of Basic Type (Unit mm)

DDAT Bore size × Stroke1 × Stroke2



Bore size \ Code	A2	B	C	D	E	F	G	G2	H	I	J	K
40	257	49	93	32	34	15	31	20	21	22	8	M14×1.5
50	265	57	93	38	42	15	31	20	29	27	11	M18×1.5
63	271	57	96	38	42	15	32	20	29	27	11	M18×1.5
80	318	75	108	44	54	21	36	25	37	32	13	M22×1.5
100	318	75	108	50	54	21	36	25	37	36	14	M26×1.5

Bore size \ Code	L	M	N	O	P	Q	R	S	T	V	W
40	M 6×1 Depth 14	4	18	Rc1/4	25.5	10	2	50	37	16	14
50	M 6×1 Depth 14	7	18	Rc3/8	24	12	2	62	47	20	17
63	M 8×1.25 Depth 14	8	18	Rc3/8	25	12	2	75	56	20	17
80	M10×1.5 Depth 15	11	20	Rc1/2	29	16	2	94	70	25	21
100	M10×1.5 Depth 15	12	20	Rc1/2	29	18	2	112	84	30	26

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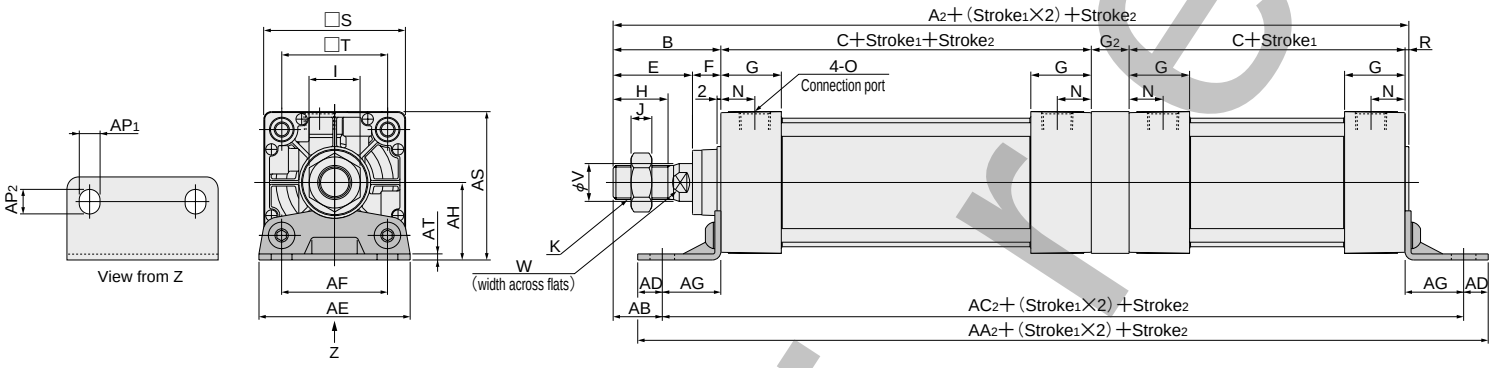
Dimensions of Foot Mounting Type (Unit mm)

DDAT Bore size × Stroke1 × Stroke2 **-1**

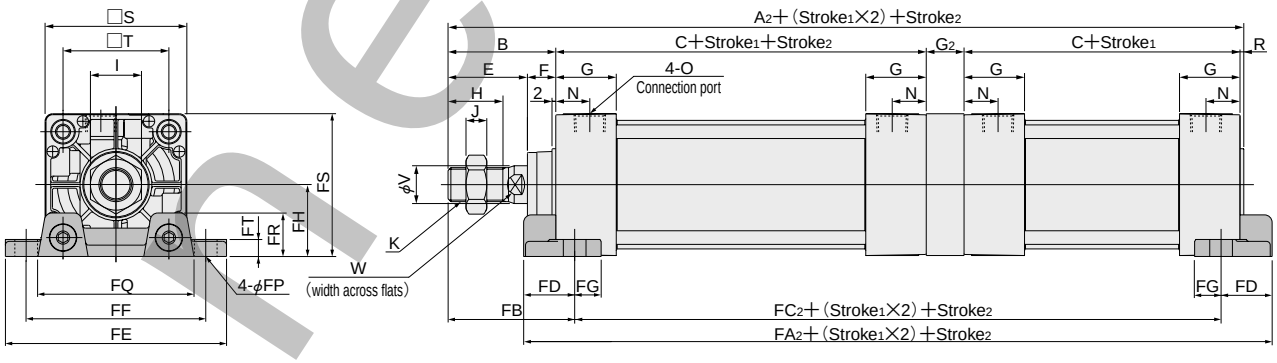


Bore size \ Code	A_2	B	C	E	F	G	G_2	H	I	J	K	N	O	R	S	T	V	W
40	257	49	93	34	15	31	20	21	22	8	M14×1.5	18	Rc1/4	2	50	37	16	14
50	265	57	93	42	15	31	20	29	27	11	M18×1.5	18	Rc3/8	2	62	47	20	17
63	271	57	96	42	15	32	20	29	27	11	M18×1.5	18	Rc3/8	2	75	56	20	17
80	318	75	108	54	21	36	25	37	32	13	M22×1.5	20	Rc1/2	2	94	70	25	21
100	318	75	108	54	21	36	25	37	36	14	M26×1.5	20	Rc1/2	2	112	84	30	26

Bore size \ Code	AA_2	AB	AC_2	AD	AE	AF	AG	AH	AP_1	AP_2	AS	AT
40	278	25.5	253	12.5	57	36	23.5	30	11	13	55	3.2
50	286	29	262	12	68	47	28	36.5	11	13	67.5	3.2
63	300	26	274	13	80	56	31	41	11	13	78.5	3.2
80	333	45	301	16	97	70	30	49	14	16	96	4
100	333	45	301	16	112	84	30	57	14	16	113	4

Dimensions of Axis Right Angled Foot Mounting Type (Unit mm)

DDAT Bore size × Stroke1 × Stroke2 **-2**



Bore size \ Code	A_2	B	C	E	F	G	G_2	H	I	J	K	N	O	R	S	T	V	W
40	257	49	93	34	15	31	20	21	22	8	M14×1.5	18	Rc1/4	2	50	37	16	14
50	265	57	93	42	15	31	20	29	27	11	M18×1.5	18	Rc3/8	2	62	47	20	17
63	271	57	96	42	15	32	20	29	27	11	M18×1.5	18	Rc3/8	2	75	56	20	17
80	318	75	108	54	21	36	25	37	32	13	M22×1.5	20	Rc1/2	2	94	70	25	21
100	318	75	108	54	21	36	25	37	36	14	M26×1.5	20	Rc1/2	2	112	84	30	26

Bore size \ Code	FA_2	FB	FC_2	FD	FE	FF	FG	FH	FP	FQ	FR	FS	FT
40	232	59	186	23	92	70	14	25	12	58	16	50	8
50	236	67	186	25	105	83	14	31	12	68	17	62	9
63	246	67	192	27	117	95	14	38	12	84	22	75.5	9
80	283	88	215	34	147	121	18	47	14	104	28	94	13
100	291	88	215	38	168	140	18	57	14	120	30	113	14

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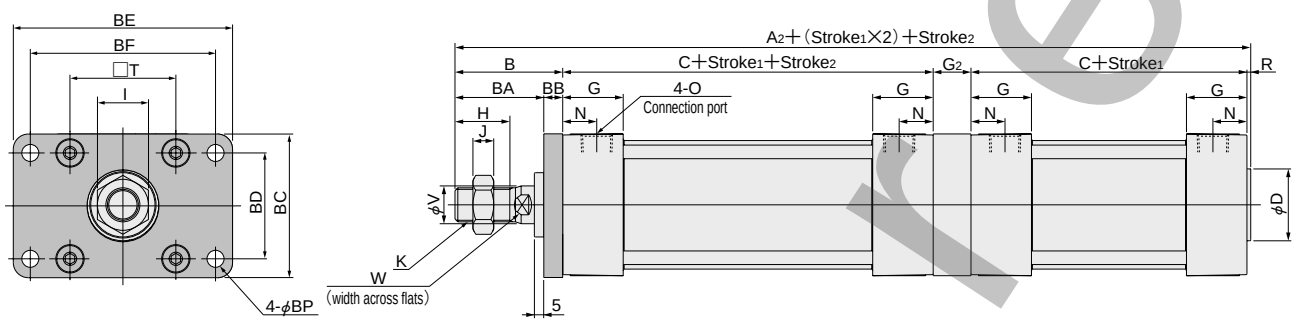
Dimensions of Rod Side Flange Mounting Type (Unit mm)

DDAT Bore size × Stroke1 × Stroke2 **-3**

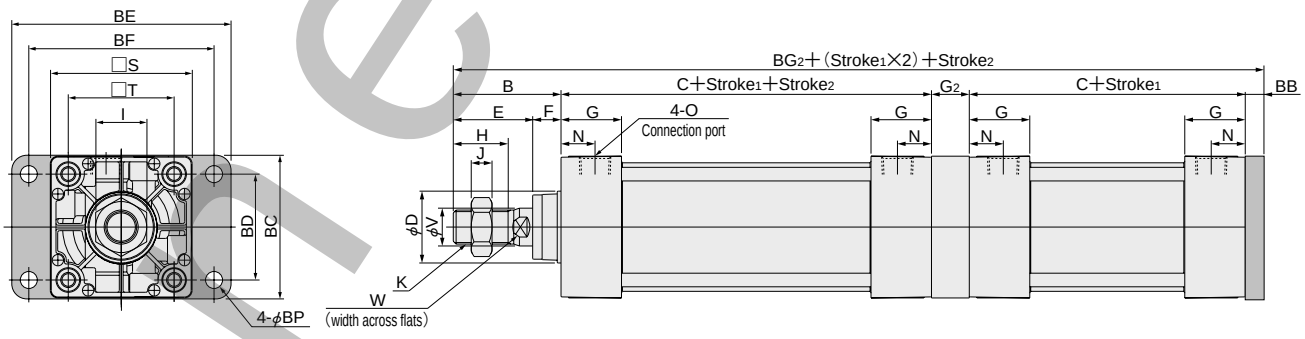


Bore size \ Code	A2	B	C	D	G	G2	H	I	J	K	N	O	R	T	V	W
40	257	49	93	32	31	20	21	22	8	M14×1.5	18	Rc1/4	2	37	16	14
50	265	57	93	38	31	20	29	27	11	M18×1.5	18	Rc3/8	2	47	20	17
63	271	57	96	38	32	20	29	27	11	M18×1.5	18	Rc3/8	2	56	20	17
80	318	75	108	44	36	25	37	32	13	M22×1.5	20	Rc1/2	2	70	25	21
100	318	75	108	50	36	25	37	36	14	M26×1.5	20	Rc1/2	2	84	30	26

Bore size \ Code	BA	BB	BC	BD	BE	BF	BP
40	39	10	52	36	84	70	7
50	47	10	65	47	104	86	9
63	47	10	76	56	116	98	9
80	59	16	95	70	143	119	12
100	59	16	115	84	162	138	12

Dimensions of Head Side Flange Mounting Type (Unit mm)

DDAT Bore size × Stroke1 × Stroke2 **-5**



Bore size \ Code	B	C	D	E	F	G	G2	H	I	J	K	N	O	S	T	V	W
40	49	93	32	34	15	31	20	21	22	8	M14×1.5	18	Rc1/4	50	37	16	14
50	57	93	38	42	15	31	20	29	27	11	M18×1.5	18	Rc3/8	62	47	20	17
63	57	96	38	42	15	32	20	29	27	11	M18×1.5	18	Rc3/8	75	56	20	17
80	75	108	44	54	21	36	25	37	32	13	M22×1.5	20	Rc1/2	94	70	25	21
100	75	108	50	54	21	36	25	37	36	14	M26×1.5	20	Rc1/2	112	84	30	26

Bore size \ Code	BB	BC	BD	BE	BF	BG2	BP
40	10	52	36	84	70	265	7
50	10	65	47	104	86	273	9
63	10	76	56	116	98	279	9
80	16	95	70	143	119	332	12
100	16	115	84	162	138	332	12

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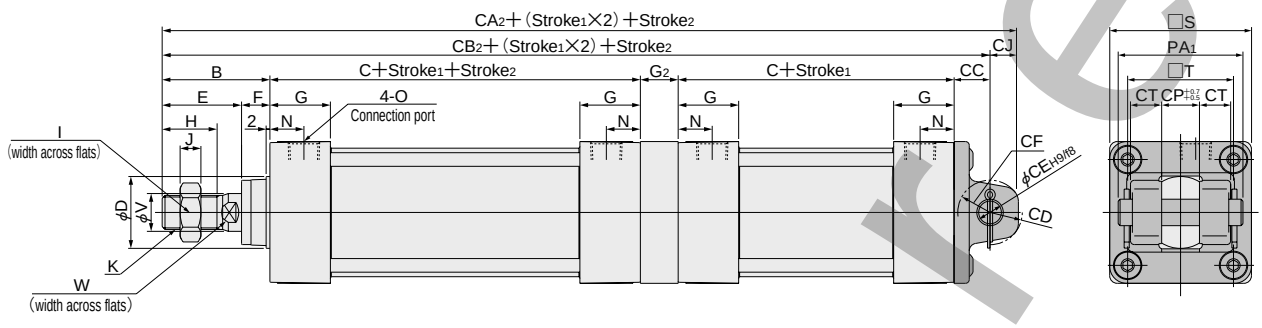
Dimensions of Clevis Mounting Type (Unit mm)

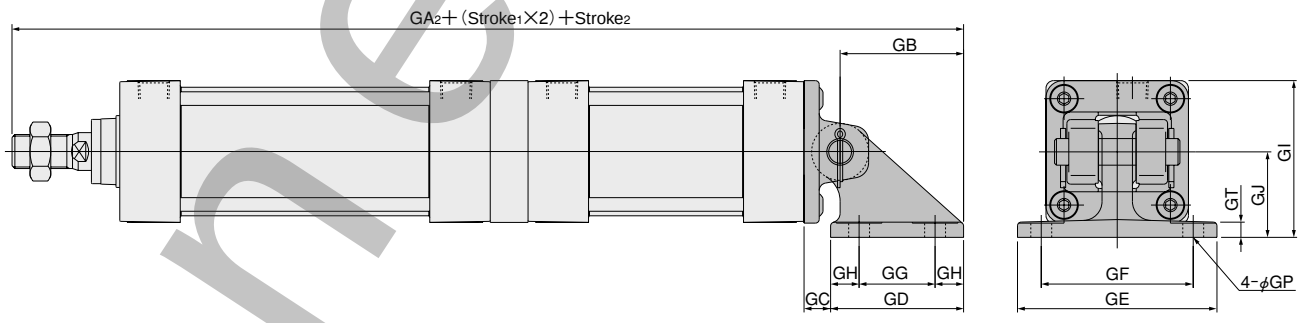
DDAT Bore size × Stroke1 × Stroke2 **-7**



Bore size \ Code	B	C	D	E	F	G	G2	H	I	J	K	N	O	S	T	V	W
40	49	93	32	34	15	31	20	21	22	8	M14×1.5	18	Rc1/4	50	37	16	14
50	57	93	38	42	15	31	20	29	27	11	M18×1.5	18	Rc3/8	62	47	20	17
63	57	96	38	42	15	32	20	29	27	11	M18×1.5	18	Rc3/8	75	56	20	17
80	75	108	44	54	21	36	25	37	32	13	M22×1.5	20	Rc1/2	94	70	25	21
100	75	108	50	54	21	36	25	37	36	14	M26×1.5	20	Rc1/2	112	84	30	26

Bore size \ Code	CA2	CB2	CC	CD	CE	CF	CJ	CP	CT	PA1
40	287	274	19	R15	14	R17	13	20	12.5	58
50	297	282	19	R17	14	R17	15	20	16.5	66
63	303	288	19	R17	14	R17	15	20	16.5	66
80	369	348	32	R24	20	R30	21	32	17.5	78
100	369	348	32	R24	20	R30	21	32	17.5	78

●With Supporting Bracket DDAT Bore size × Stroke1 × Stroke2 **-7-7C**



Bore size \ Code	GA2	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GP	GT
40	340.5	66.5	12.5	73	105	80	40	16.5	70	45	11(Thru hole)	8
50	348.5	66.5	12.5	73	105	80	40	16.5	76	45	11(Thru hole)	8
63	354.5	66.5	12.5	73	105	80	40	16.5	82.5	45	11(Thru hole)	8
80	434.5	86.5	20.5	98	135	105	65	16.5	107	60	14(Thru hole)	12
100	434.5	86.5	20.5	98	135	105	65	16.5	116	60	14(Thru hole)	12

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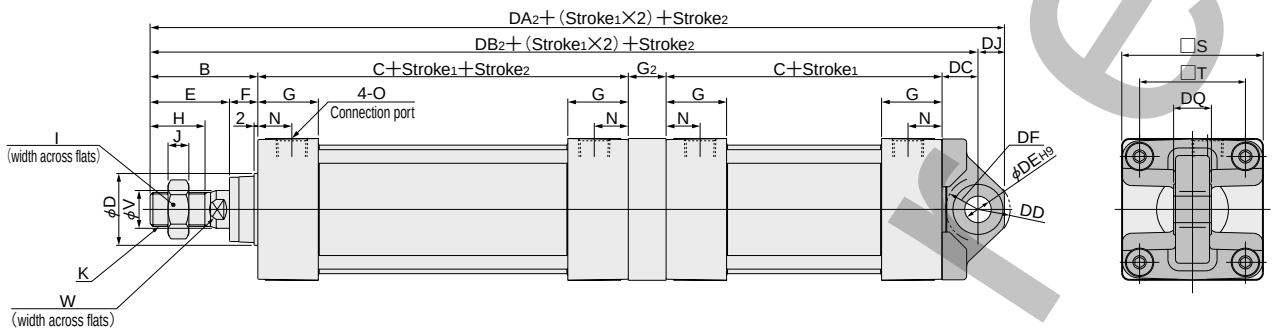
Dimensions of Pivot Mounting Type (Unit mm)

DDAT Bore size × Stroke1 × Stroke2 **-8**



Bore size \ Code	B	C	D	E	F	G	G2	H	I	J	K	N	O	S	T	V	W
40	49	93	32	34	15	31	20	21	22	8	M14×1.5	18	Rc1/4	50	37	16	14
50	57	93	38	42	15	31	20	29	27	11	M18×1.5	18	Rc3/8	62	47	20	17
63	57	96	38	42	15	32	20	29	27	11	M18×1.5	18	Rc3/8	75	56	20	17
80	75	108	44	54	21	36	25	37	32	13	M22×1.5	20	Rc1/2	94	70	25	21
100	75	108	50	54	21	36	25	37	36	14	M26×1.5	20	Rc1/2	112	84	30	26

Bore size \ Code	DA2	DB2	DC	DD	DE	DF	DJ	DQ
40	288	274	19	R17	14	R17	14	$20^{0}_{-0.084}$
50	296	282	19	R17	14	R17	14	$20^{0}_{-0.084}$
63	302	288	19	R17	14	R17	14	$20^{0}_{-0.084}$
80	369	348	32	R24	20	R25	21	$32^{0}_{-0.100}$
100	368	348	32	R24	20	R26	20	$32^{0}_{-0.100}$

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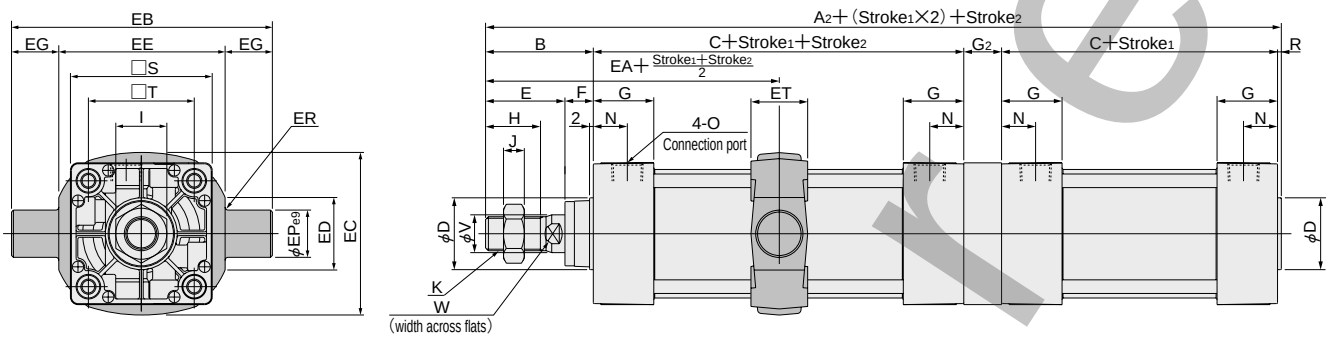
Dimensions of Trunnion Type (Unit mm)

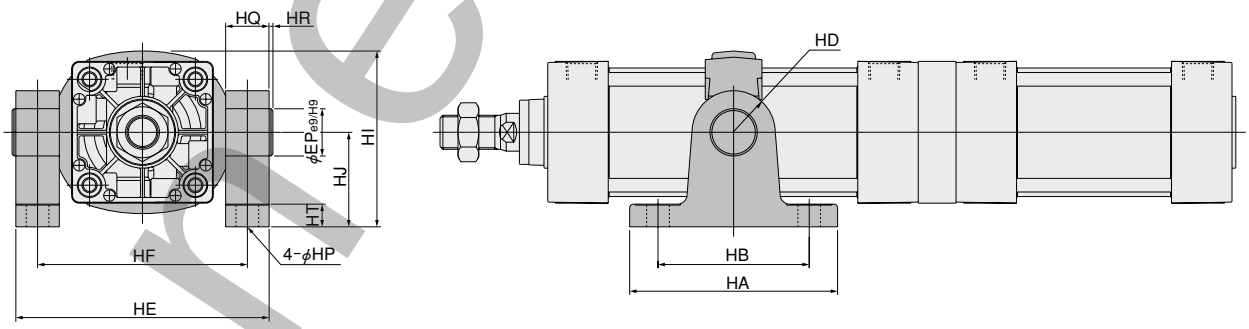
DDAT Bore size × Stroke1 × Stroke2 **-11**



Bore size \ Code	A2	B	C	D	E	F	G	G2	H	I	J	K	N	O	R	S	T	V	W
40	257	49	93	32	34	15	31	20	21	22	8	M14×1.5	18	Rc1/4	2	50	37	16	14
50	265	57	93	38	42	15	31	20	29	27	11	M18×1.5	18	Rc3/8	2	62	47	20	17
63	271	57	96	38	42	15	32	20	29	27	11	M18×1.5	18	Rc3/8	2	75	56	20	17
80	318	75	108	44	54	21	36	25	37	32	13	M22×1.5	20	Rc1/2	2	94	70	25	21
100	318	75	108	50	54	21	36	25	37	36	14	M26×1.5	20	Rc1/2	2	112	84	30	26

Bore size \ Code	EA	EB	EC	ED	EE	EG	EP	ER	ET
40	95.5	113	60	30	63	25	25	R1.6	30
50	103.5	126	72	30	76	25	25	R1.6	30
63	105	138	87	40	88	25	25	R1.6	30
80	129	164	105	40	114	25	25	R1.6	35
100	129	182	129	44	132	25	25	R2	40

●With Supporting Bracket **DDAT** Bore size × Stroke1 × Stroke2 **-11-11T**



Bore size \ Code	HA	HB	HD	HE	HF	HI	HJ	HP	HQ	HR	HT	EP
40	111	80	R22	109	86	80	50	12(Thru hole)	23	2	14	25
50	111	80	R22	122	99	86	50	12(Thru hole)	23	2	14	25
63	111	80	R22	134	111	93.5	50	12(Thru hole)	23	2	14	25
80	121	85	R22	160	137	122.5	70	14(Thru hole)	23	2	14	25
100	121	85	R22	178	155	134.5	70	14(Thru hole)	23	2	14	25

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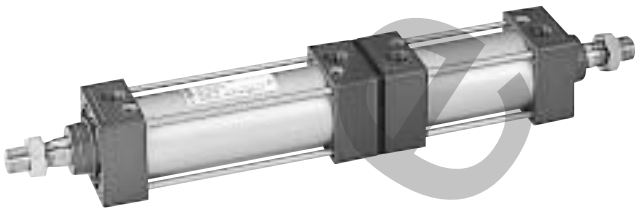
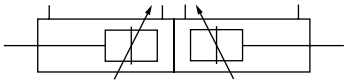
NEW DYNA Dual Stroke Cylinders



Symbol



Specifications

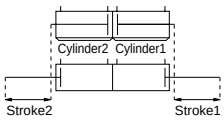
Item \ Bore size mm	40	50	63	80	100
Operating method	Double acting type				
Media	Air				
Mounting type	Basic type, Foot mounting type, Axis right angled foot mounting type, Flange mounting type, Trunnion type				
Operating pressure range MPa {kgf/cm²}	0.05～0.7 {0.5～7.1}				
Proof pressure MPa {kgf/cm²}	1.05 {10.7}				
Operating temperature range ˚C	—10～70 (Freezing not allowed, with sensor is 0～60.)				
Operating speed range mm/s	30～700				
Cushion	Variable cushion at both ends of stroke (applied to each cylinder)				
Cushion stroke mm	16	20		25	
Lubrication	Not required (But if you must use lubrication, use Turbine Oil No.1〔ISO VG32〕or equivalent)				
Port size Rc	1/4	3/8		1/2	

Bore size and Stroke

mm

Bore size	Standard stroke	Maximum potential manufacturing stroke
40	50, 75, 100, 150, 200, 250, 300, 350, 400, 450	800
50	50, 75, 100, 150, 200, 250, 300, 350, 400, 450, 500	1000
63		
80	50, 75, 100, 150, 200, 250, 300, 350, 400, 450, 500	1000
100	600, 700	

●**Regarding stroke 1 and stroke 2**
Stroke 1 is the stroke of cylinder 1.
Stroke 2 is the stroke of cylinder 2.



Remarks : 1. Stroke tolerance: Strokes of 250 or less are $^{+1}_{0}$, strokes of 251～1000 are $^{+1.5}_{0}$.
2. The table at left applies to both stroke 1 and stroke 2. However, do not let (stroke 1 + stroke 2) exceed the maximum stroke.
3. For non-standard strokes, consult us.
4. For the maximum potential manufacturing stroke with bellows specification, see p.104.

Order Code

DDA □ **63×100×50** – □ – □ – □ – □ □ □

NEW DYNA Cylinders
Basic model

Bore size
×
Stroke 1
×
Stroke 2

Cylinder specification
W —— Dual stroke cylinders
JW —— Dual stroke cylinders with bellow

Types of bellows
JT —— Nylon tarpaulin (～80˚C)
JC —— Chloroprene (～100˚C)
JK —— Cornex (～200˚C)
JA —— Arumix (～250˚C)
●Attached on both sides
●Cornex is a registered trademark of Teijin, Inc.
●The temperature shown is the bellows own durable temperature, and is not a temperature for cylinder use.

Mounting type
Blank — Basic type
1 —— Foot mounting type
2 —— Axis right angled foot mounting type
3 —— Flange mounting type
11 —— Trunnion type
11-11T — Trunnion type (with supporting bracket)
●Mounting brackets are included at time of delivery, with the exception of the trunnion type.
●Orders for mounting brackets only are also accepted.

Rod end mounting
Blank — Without rod end mounting
Y —— With Y type knuckle (with pin)
I —— With I type knuckle
●Rod end mountings are included at time of delivery. If required for both sides, place separate orders. For order code example, see p.104.
●Place separate orders for the cylinder joint and cylinder rod end.
●Orders for rod end mounting only are also accepted.
●For rod end mounting dimensions, see p.105.

Sensor switch (for cylinder with magnet)

ZC130 — 2-lead wires	Solid state type	with indicator lamp	DC10～28V
ZC153 — 3-lead wires	Solid state type	with indicator lamp	DC4.5～28V
CS5T — 2-lead wires	Reed switch type	without indicator lamp	DC5～28V, AC85～115V
CS11T — 2-lead wires	Reed switch type	with indicator lamp	DC10～28V
CS2F — DIN type	Reed switch type	with indicator lamp	AC85～230V
CS3F — DIN type	Reed switch type	with indicator lamp	DC10～30V
CS4F — DIN type	Reed switch type	with indicator lamp	DC10～30V
CS5F — DIN type	Reed switch type	without indicator lamp	DC3～30V

●For sensor switch specifications, see p.97, while for mountings, see p.101.
●**CS□F** comes with a DIN connector. All others are grommet type.
●Orders for sensor switches only are also accepted.

Lead wire length
(Applicable to **ZC,CS□T type**)
A : 1000mm
B : 3000mm

Number of sensor switches
1 — With one sensor switch
2 — With two sensor switches
⋮ ⋮
n — With n sensor switches

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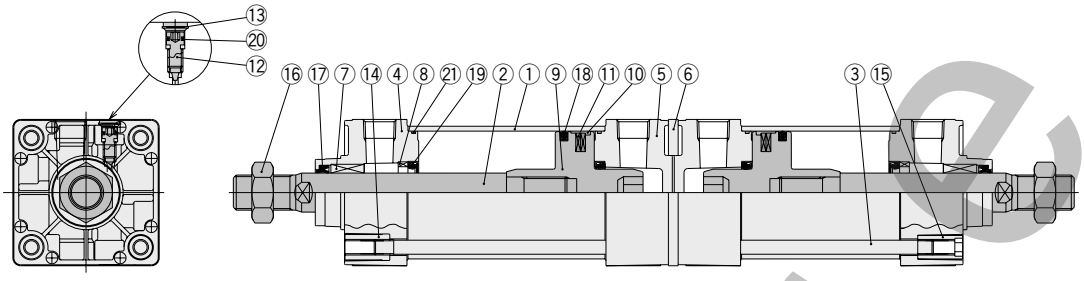
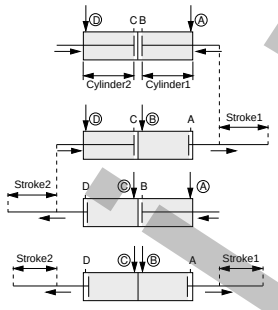
Inner Construction and Major Parts



●Explanation of dual stroke cylinder operation

Dual stroke cylinders are a set of two cylinders combined back-to-back. The cylinder body can be fixed in place and the left- and right-side strokes controlled separately, and can also be used to obtain two-step or three-step strokes by fixing the piston rod on one side in place.



Stroke 2 and stroke 1 are retracted when air is supplied from Ports Ⓐ and Ⓓ.

Stroke 1 moves when air is supplied from Ports Ⓑ and Ⓓ.

Stroke 2 moves when air is supplied from Ports Ⓐ and Ⓒ.

Stroke 1 and stroke 2 move when air is supplied from Ports Ⓒ and Ⓑ.

Major Parts and Materials

No.	Parts	Materials
①	Cylinder tube	Aluminum alloy
②	Piston rod	Carbon steel for machine structural use
③	Tie rod	Carbon steel for machine structural use
④	Rod cover	Aluminum die-cast
⑤	Head cover	Aluminum die-cast
⑥	Spacer	Aluminum alloy
⑦	Rod bushing	Oil-permeated sintered copper alloy
⑧	Keep ring	Aluminum alloy
⑨	Piston	Aluminum alloy
⑩	Wear ring	Plastic
⑪	Magnet	Rubber magnet
⑫	Cushion needle	Carbon steel for machine structural use
⑬	Snap ring	Spring steel
⑭	Tie rod nut R	Rolled steel for general structural use

No.	Parts	Materials
⑮	Tie rod nut H	Chrome-molybdenum steel
⑯	Rod end nut	Rolled steel for general structural use
⑰	Rod seal	Synthetic rubber (NBR)
⑱	Piston seal	Synthetic rubber (NBR)
⑲	Cushion seal	Synthetic rubber (NBR)
⑳	Cushion gasket	Synthetic rubber (NBR)
㉑	Tube gasket	Synthetic rubber (NBR)
—	Foot bracket	Rolled steel for general structural use
—	Axial right angled foot bracket	Cast iron
—	Flange mounting bracket	Rolled steel for general structural use
—	Trunnion bracket	Cast iron
—	Trunnion supporting bracket	Cast iron
—	Knuckles	Cast iron

Seals

Parts / Bore size mm \ Quantity	Rod seal	Piston seal	Cushion seal	Tube gasket	Cushion gasket
	2★	2★	4	4★	4
40	DRP16	PWP40N	CPF20	1.5×40	S5
50	DRP20	PWP50N	CPF24	1.5×50	S6
63	DRP20	PWP63N	CPF24	1.5×63	S6
80	DRP25	PWP80N	CPF30	1.5×80	S6
100	DRP30	PWP100N	CPF35	1.5×100	S6

Remark: Starred ★ designate items available as repair kits.

Order code

SRK-NDDA Bore size

Note that the repair kit is for a standard cylinder and its content consists of one rod seal, one piston seal, and two cylinder tube gaskets.

Mass

kg

Bore size mm	Mass at zero stroke						Additional mass for each 1mm stroke	Mass of one sensor switch [with holder]		Mass of one knuckle	
	Basic type	Foot mounting type	Axis right angled foot mounting type	Flange mounting type	Trunnion type	Trunnion type (with supporting bracket)		ZC□□□ CS□□T Note2	CS□F	Y type knuckle (with pin)	I type knuckle
40	1.32	1.45	1.52	1.69	1.80	2.30	0.00300	0.04	0.05	0.27	0.16
50	2.08	2.25	2.40	2.47	2.63	3.13	0.00428			0.34	0.21
63	2.78	3.01	3.30	3.31	3.48	3.98	0.00515	0.04	0.06	0.34	0.21
80	4.74	5.12	5.59	6.34	5.90	6.62	0.00834			0.87	0.62
100	6.02	6.49	7.30	8.24	7.55	8.27	0.01061			1.47	1.24

Notes: 1. Applicable to both stroke 1 and stroke 2.
2. For lead wire length A (1000mm).

Calculation example: For a foot mounting type with bore size of 50mm, and stroke 1 of 100mm and stroke 2 of 50mm
2.25＋(0.00428×100)＋(0.00428×50)＝2.892kg

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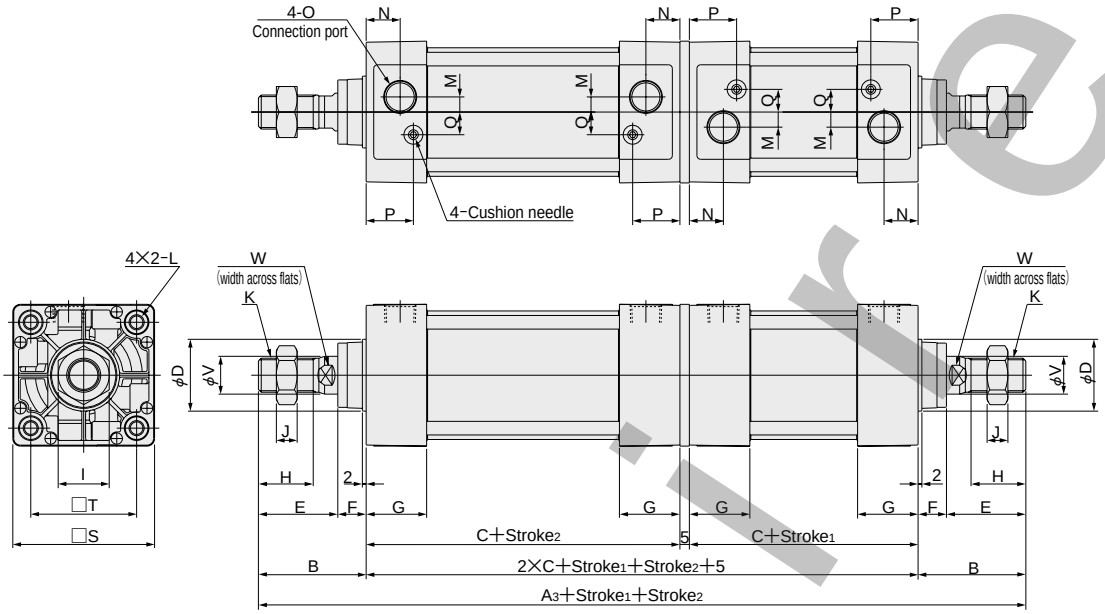
Dimensions of Basic Type (Unit mm)

DDAW Bore size × Stroke1 × Stroke2



Bore size \ Code	A3	B	C	D	E	F	G	H	I	J	K	L
40	289	49	93	32	34	15	31	21	22	8	M14×1.5	M6×1 Depth 14
50	305	57	93	38	42	15	31	29	27	11	M18×1.5	M6×1 Depth 14
63	311	57	96	38	42	15	32	29	27	11	M18×1.5	M8×1.25 Depth 14
80	371	75	108	44	54	21	36	37	32	13	M22×1.5	M10×1.5 Depth 15
100	371	75	108	50	54	21	36	37	36	14	M26×1.5	M10×1.5 Depth 15

Bore size \ Code	M	N	O	P	Q	S	T	V	W
40	4	18	Rc1/4	25.5	10	50	37	16	14
50	7	18	Rc3/8	24	12	62	47	20	17
63	8	18	Rc3/8	25	12	75	56	20	17
80	11	20	Rc1/2	29	16	94	70	25	21
100	12	20	Rc1/2	29	18	112	84	30	26

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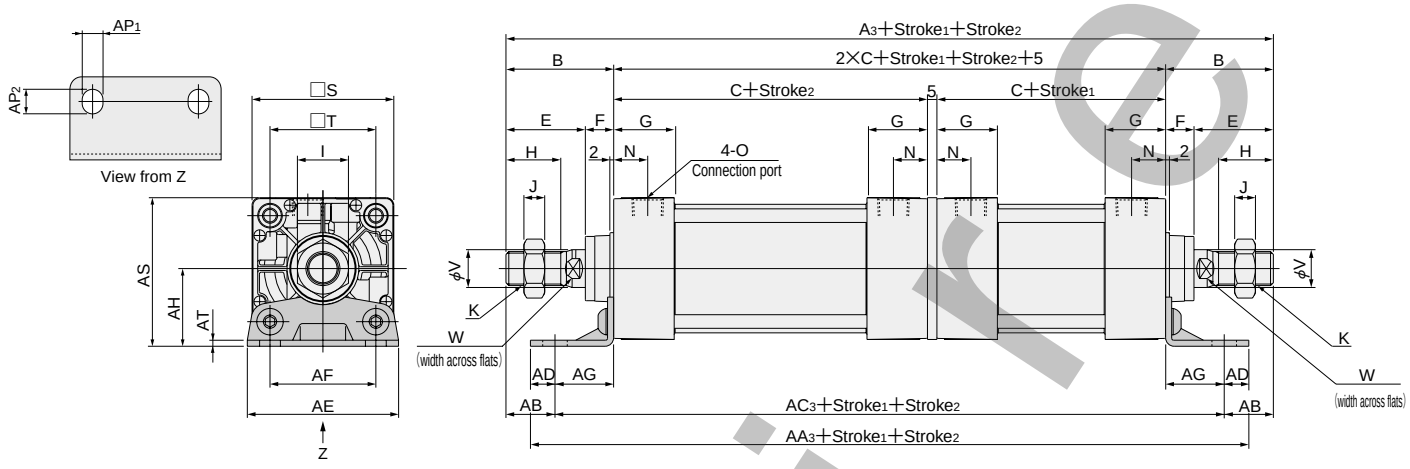
Dimensions of Foot Mounting Type (Unit mm)

DDAW Bore size × Stroke1 × Stroke2 **-1**

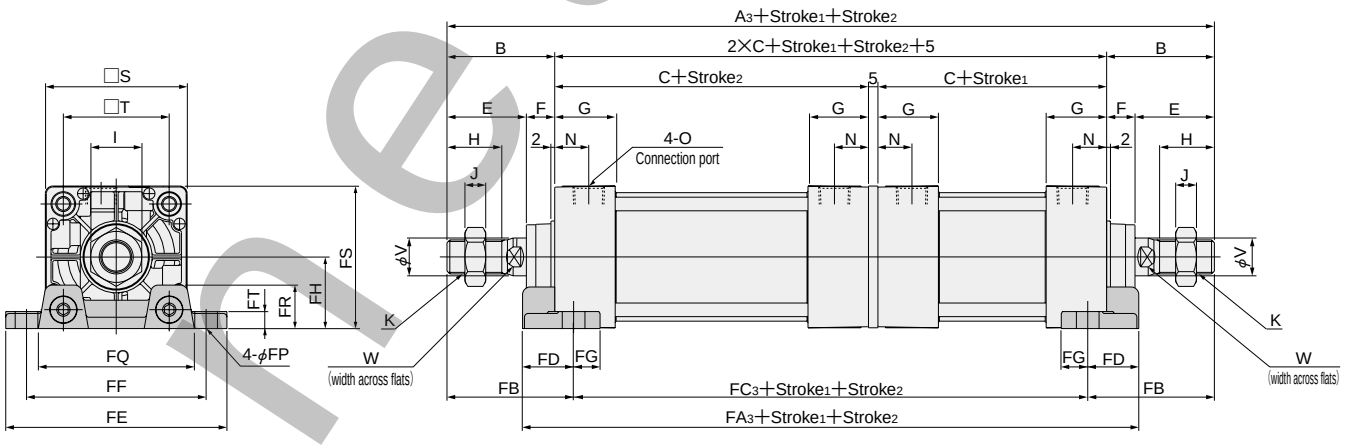


Bore size \ Code	A3	B	C	E	F	G	H	I	J	K	N	O	S	T	V	W
40	289	49	93	34	15	31	21	22	8	M14×1.5	18	Rc1/4	50	37	16	14
50	305	57	93	42	15	31	29	27	11	M18×1.5	18	Rc3/8	62	47	20	17
63	311	57	96	42	15	32	29	27	11	M18×1.5	18	Rc3/8	75	56	20	17
80	371	75	108	54	21	36	37	32	13	M22×1.5	20	Rc1/2	94	70	25	21
100	371	75	108	54	21	36	37	36	14	M26×1.5	20	Rc1/2	112	84	30	26

Bore size \ Code	AA3	AB	AC3	AD	AE	AF	AG	AH	AP1	AP2	AS	AT
40	263	25.5	238	12.5	57	36	23.5	30	11	13	55	3.2
50	271	29	247	12	68	47	28	36.5	11	13	67.5	3.2
63	285	26	259	13	80	56	31	41	11	13	78.5	3.2
80	313	45	281	16	97	70	30	49	14	16	96	4
100	313	45	281	16	112	84	30	57	14	16	113	4

Dimensions of Axis Right Angled Foot Mounting Type (Unit mm)

DDAW Bore size × Stroke1 × Stroke2 **-2**



Bore size \ Code	A3	B	C	E	F	G	H	I	J	K	N	O	S	T	V	W
40	289	49	93	34	15	31	21	22	8	M14×1.5	18	Rc1/4	50	37	16	14
50	305	57	93	42	15	31	29	27	11	M18×1.5	18	Rc3/8	62	47	20	17
63	311	57	96	42	15	32	29	27	11	M18×1.5	18	Rc3/8	75	56	20	17
80	371	75	108	54	21	36	37	32	13	M22×1.5	20	Rc1/2	94	70	25	21
100	371	75	108	54	21	36	37	36	14	M26×1.5	20	Rc1/2	112	84	30	26

Bore size \ Code	FA3	FB	FC3	FD	FE	FF	FG	FH	FP	FQ	FR	FS	FT
40	217	59	171	23	92	70	14	25	12	58	16	50	8
50	221	67	171	25	105	83	14	31	12	68	17	62	9
63	231	67	177	27	117	95	14	38	12	84	22	75.5	9
80	263	88	195	34	147	121	18	47	14	104	28	94	13
100	271	88	195	38	168	140	18	57	14	120	30	113	14

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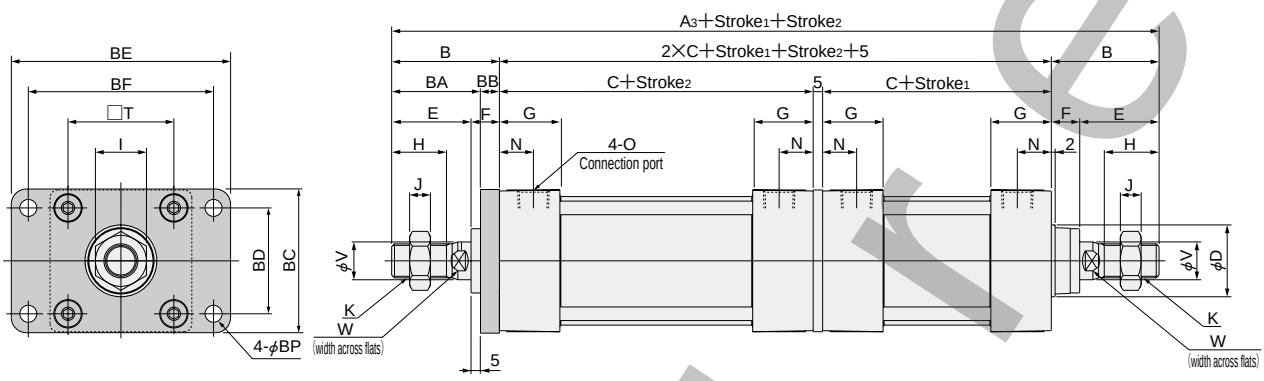
Dimensions of Flange Mounting Type (Unit mm)

DDAW Bore size × Stroke1 × Stroke2 **-3**



Bore size \ Code	A3	B	C	D	E	F	G	H	I	J	K	N	O	T	V	W
40	289	49	93	32	34	15	31	21	22	8	M14×1.5	18	Rc1/4	37	16	14
50	305	57	93	38	42	15	31	29	27	11	M18×1.5	18	Rc3/8	47	20	17
63	311	57	96	38	42	15	32	29	27	11	M18×1.5	18	Rc3/8	56	20	17
80	371	75	108	44	54	21	36	37	32	13	M22×1.5	20	Rc1/2	70	25	21
100	371	75	108	50	54	21	36	37	36	14	M26×1.5	20	Rc1/2	84	30	26

Bore size \ Code	BA	BB	BC	BD	BE	BF	BP
40	39	10	52	36	84	70	7
50	47	10	65	47	104	86	9
63	47	10	76	56	116	98	9
80	59	16	95	70	143	119	12
100	59	16	115	84	162	138	12

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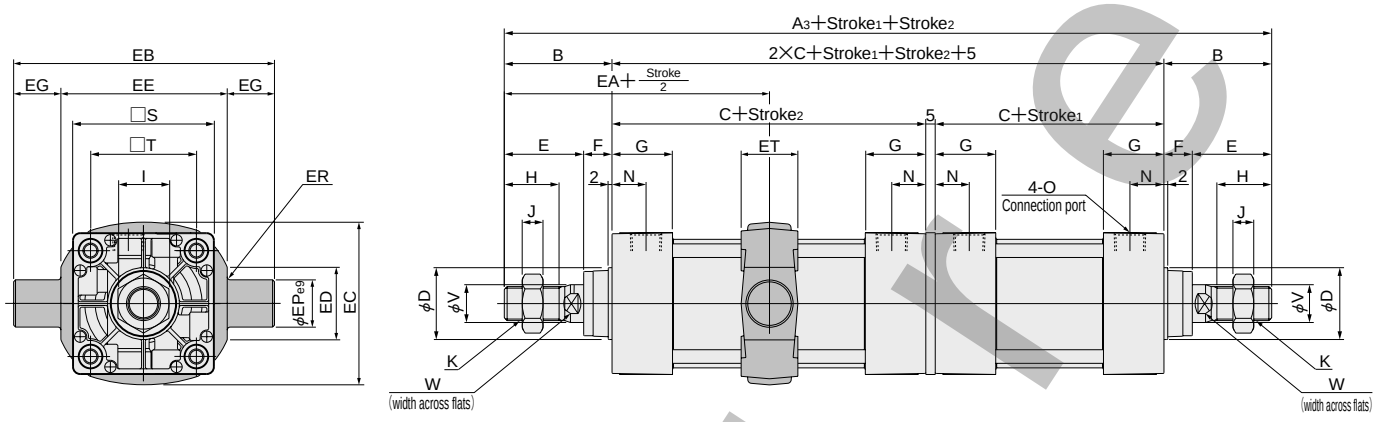
Dimensions of Trunnion Type (Unit mm)

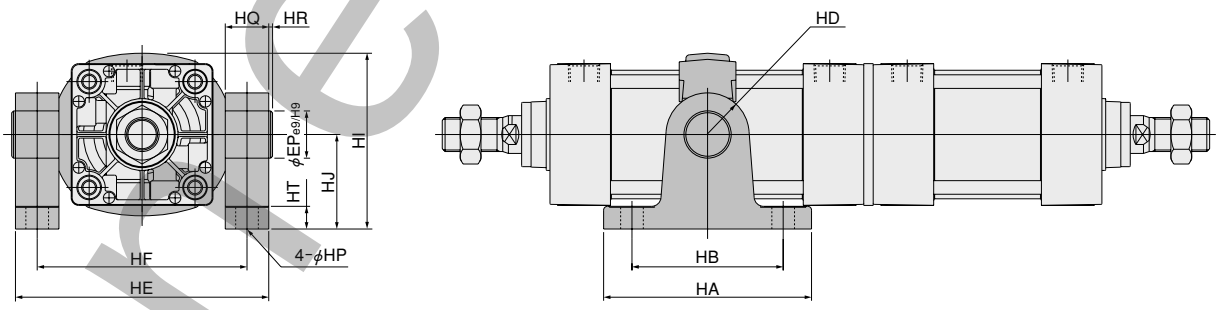
DDAW Bore size × Stroke1 × Stroke2 **-11**



Bore size \ Code	A3	B	C	D	E	F	G	H	I	J	K	N	O	S	T	V	W
40	289	49	93	32	34	15	31	21	22	8	M14×1.5	18	Rc1/4	50	37	16	14
50	305	57	93	38	42	15	31	29	27	11	M18×1.5	18	Rc3/8	62	47	20	17
63	311	57	96	38	42	15	32	29	27	11	M18×1.5	18	Rc3/8	75	56	20	17
80	371	75	108	44	54	21	36	37	32	13	M22×1.5	20	Rc1/2	94	70	25	21
100	371	75	108	50	54	21	36	37	36	14	M26×1.5	20	Rc1/2	112	84	30	26

Bore size \ Code	EA	EB	EC	ED	EE	EG	EP	ER	ET
40	95.5	113	60	30	63	25	25	R1.6	30
50	103.5	126	72	30	76	25	25	R1.6	30
63	105	138	87	40	88	25	25	R1.6	30
80	129	164	105	40	114	25	25	R1.6	35
100	129	182	129	44	132	25	25	R2	40

● **With Supporting Bracket** **DDAW** Bore size × Stroke1 × Stroke2 **-11-11T**



Bore size \ Code	HA	HB	HD	HE	HF	HI	HJ	HP	HQ	HR	HT	EP
40	111	80	R22	109	86	80	50	12(Thru hole)	23	2	14	25
50	111	80	R22	122	99	86	50	12(Thru hole)	23	2	14	25
63	111	80	R22	134	111	93.5	50	12(Thru hole)	23	2	14	25
80	121	85	R22	160	137	122.5	70	14(Thru hole)	23	2	14	25
100	121	85	R22	178	155	134.5	70	14(Thru hole)	23	2	14	25

Preview

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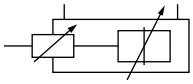
NEW DYNA Stroke Adjusting Cylinders

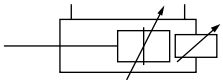
Push side stroke adjusting type, Pull side stroke adjusting type

Symbol

●Push side stroke adjusting type



●Pull side stroke adjusting type



Specifications

Item \ Bore size mm		40	50	63	80	100
Operating method		Double acting type with stroke adjusting mechanism				
Media		Air				
Mounting type		Basic type, Foot mounting type, Axis right angled foot mounting type, Rod side flange mounting type, Trunnion type				
Stroke adjusting range mm	Push side stroke	−50～0 (To the specified stroke)				
	Pull side stroke	−60～0 (To the specified stroke)				
Operating pressure range MPa {kgf/cm²}		0.05～1.0 {0.5～10.2}				
Proof pressure MPa {kgf/cm²}		1.5 {15.3}				
Operating temperature range °C		−10～70 (Freezing not allowed, with sensor is 0～60.)				
Operating speed range mm/s	Push side stroke	50～700 Note 1				
	Pull side stroke	30～700 Note 2				
Cushion	Push side stroke	Head cover side: Variable cushion Rod cover side: Rubber bumpers				
	Pull side stroke	Rod cover side: Variable cushion Head cover side: none				
Cushion stroke mm		16	20		25	
Lubrication		Not required (But if you must use lubrication, use Turbine oil Class 1〔ISO VG32〕or equivalent)				
Port size Rc		1/4	3/8		1/2	

Notes : 1. For pull side: 50～500mm/s, in the case of push side (Stroke adjusting side) ϕ40: Adjustment 10mm or less, ϕ50, 63: Adjustment 15mm or less, ϕ80, 100: Adjustment 20mm or less.
50～200mm/s, in the case of ϕ40: Adjustment 10mm or more, ϕ50, 63: Adjustment 15mm or more, ϕ80, 100: Adjustment 20mm or more.
2. For push side: 30～500mm/s, in the case of pull side (Stroke adjusting side) ϕ40: Adjustment 10mm or less, ϕ50, 63: Adjustment 15mm or less, ϕ80, 100: Adjustment 20mm or less.
30～150mm/s, in the case of ϕ40: Adjustment 10mm or more, ϕ50, 63: Adjustment 15mm or more, ϕ80, 100: Adjustment 20mm or more.

Bore Size and Stroke

●Push side stroke adjusting type

mm

Bore sizer	Standard stroke	Maximum potential manufacturing stroke
40	50, 75, 100, 150, 200, 250, 300, 350, 400 450, 500, 600, 700	700
50		
63		
80	50, 75, 100, 150, 200, 250, 300, 350, 400 450, 500, 600, 700, 800, 900	900
100		

Remarks : 1. Stroke tolerance: Strokes of 250 or less are $^{+1}_{0}$, strokes of 251～1000 are $^{+1.5}_{0}$.
2. For non-standard strokes, consult us.

●Pull side stroke adjusting type

mm

Bore sizer	Standard stroke	Maximum potential manufacturing stroke
40	50, 75, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800	1000
50	50, 75, 100, 150, 200, 250, 300, 350, 400 450, 500, 600, 700, 800, 900, 1000	1500
63		
80		
100		

Remarks: 1. Stroke tolerance: Strokes of 250 or less are $^{+1}_{0}$, strokes of 251～1000 are $^{+1.5}_{0}$, and strokes of 1001 or more are $^{+2.0}_{0}$.
2. For non-standard strokes, consult us.
3. For the maximum potential manufacturing stroke with bellows specification, see p.104.

Order Code

DDA [P] [50×100] − [ ] − [ ] − [ ] − [ ] [ ] [ ]

Bore size × Stroke

Types of bellows
- **JT** — Nylon tarpaulin (～80˚C)
- **JC** — Chloroprene (～100˚C)
- **JK** — Cornex (～200˚C)
- **JA** — Arumix (～250˚C)

●Cornex is a registered trademark of Teijin, Inc.
●The temperature shown is the bellows own durable temperature, and is not a temperature for cylinder use.

Cylinder specification
- **P** — Push side stroke adjusting cylinders
- **E** — Pull side stroke adjusting cylinders
- **JP** — Push side stroke adjusting type with bellows
- **EJ** — Pull side stroke adjusting type with bellows

NEW DYNA Cylinders
Basic model

Mounting type
- **Blank** — Basic type
- **1** — Foot mounting type
- **2** — Axis right angled foot mounting type
- **3** — Rod side flange mounting type
- **11** — Trunnion type
- **11-11T** — Trunnion type (with supporting bracket)

●Mounting brackets are included at time of delivery, with the exception of the trunnion type.
●Orders for mounting brackets only are also accepted.

Sensor switch (for cylinder with magnet)

ZC130	2-lead wires	Solid state type	with indicator lamp	DC10～28V
ZC153	3-lead wires	Solid state type	with indicator lamp	DC4.5～28V
CS5T	2-lead wires	Reed switch type	without indicator lamp	DC5～28V, AC85～115V
CS11T	2-lead wires	Reed switch type	with indicator lamp	DC10～28V
CS2F	DIN type	Reed switch type	with indicator lamp	AC85～230V
CS3F	DIN type	Reed switch type	with indicator lamp	DC10～30V
CS4F	DIN type	Reed switch type	with indicator lamp	DC10～30V
CS5F	DIN type	Reed switch type	without indicator lamp	DC3～30V

●For sensor switch specifications, see p.97, while for mountings, see p.101.
●CS□F comes with a DIN connector. All others are grommet type.

Rod end mounting
- **Blank** — Without rod end mounting
- **Y** — With Y type knuckle (with pin)
- **I** — With I type knuckle

●Place separate orders for the cylinder joint and cylinder rod end.
●Orders for rod end mountning only are also accepted.
●For rod end mountning dimensions, see p.105.

Number of sensor switches
- **1** — With one sensor switch
- **2** — With two sensor switches
- **n** — With n sensor switches

Lead wire length (Applicable to **ZC,CS□T type**)
- **A** : 1000mm
- **B** : 3000mm

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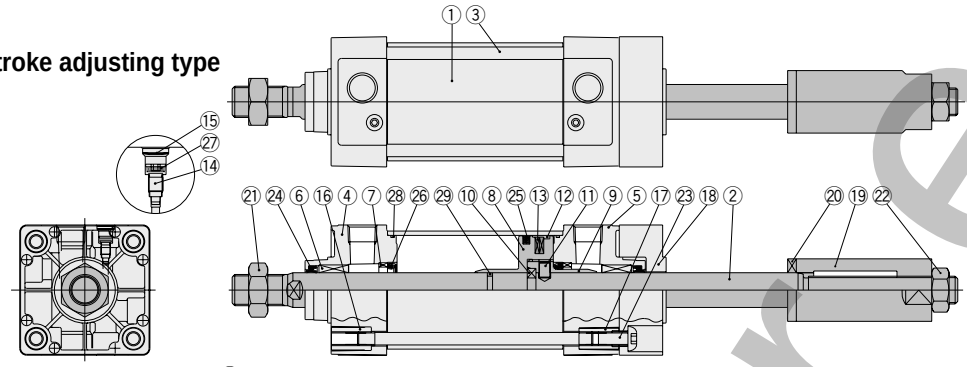
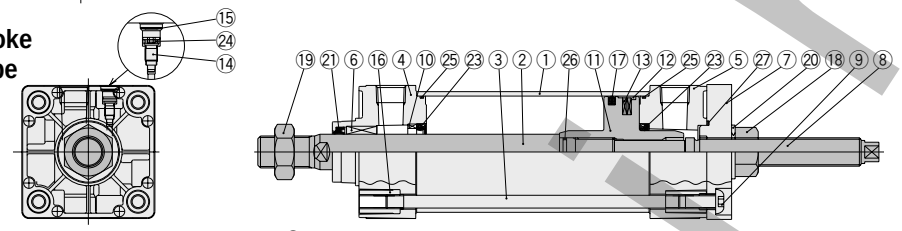
Inner Construction and Major Parts

●**Push side stroke adjusting type**



●**Pull side stroke adjusting type**



●**Instructions for stroke adjustment**

Stroke adjusting is performed by rotating the adjusting stopper (push side ⑲) and stroke adjusting screw (pull side ⑧). After completing stroke adjustment, fix in place with a lock nut.
If mounting a sensor switch, move the mounting location of the sensor switch by the length of the adjusted stroke.

Major Parts and Materials

●Push side stroke adjusting type

No.	Parts	Materials
①	Cylinder tube	Aluminum alloy
②	Piston rod	Carbon steel for machine structural use
③	Tie rod	Carbon steel for machine structural use
④	Rod cover	Aluminum die-cast
⑤	Rod cover	Aluminum die-cast
⑥	Rod bushing	Oil-permeated sintered copper alloy
⑦	Keep ring	Aluminum alloy
⑧	Piston	Aluminum alloy
⑨	Piston	Aluminum alloy
⑩	Split ring	Carbon steel for machine structural use
⑪	(Detent) pin	Carbon steel for machine structural use
⑫	Wear ring	Plastic
⑬	Magnet	Rubber magnet
⑭	Cushion needle	Carbon steel for machine structural use
⑮	Snap ring	Spring steel
⑯	Tie rod nut R	Rolled steel for general structural use
⑰	Tie rod nut H	Chrome-molybdenum steel
⑱	Stopper plate	Carbon steel for machine structural use
⑲	Adjusting stopper	Carbon steel for machine structural use
⑳	Rubber bumper	Urethane rubber
㉑	Rod end nut	Rolled steel for general structural use
㉒	Lock nut	Rolled steel for general structural use
㉓	Button bolt	Chrome-molybdenum steel
㉔	Rod seal	Synthetic rubber (NBR)
㉕	Piston seal	Synthetic rubber (NBR)
㉖	Cushion seal	Synthetic rubber (NBR)
㉗	Cushion gasket	Synthetic rubber (NBR)
㉘	Tube gasket	Synthetic rubber (NBR)
㉙	Piston gasket	Synthetic rubber (NBR)

●Pull side stroke adjusting type

No.	Parts	Materials
①	Cylinder tube	Aluminum alloy
②	Piston rod	Carbon steel for machine structural use
③	Tie rod	Carbon steel for machine structural use
④	Rod cover	Aluminum die-cast
⑤	Head cover	Aluminum die-cast
⑥	Rod bushing	Oil-permeated sintered copper alloy
⑦	Houseing	Carbon steel for machine structural use
⑧	Adjusting screw	Carbon steel for machine structural use
⑨	Button bolt	Chrome-molybdenum steel
⑩	Keep ring	Aluminum alloy
⑪	Piston	Aluminum alloy
⑫	Wear ring	Plastic
⑬	Magnet	Rubber magnet
⑭	Cushion needle	Carbon steel for machine structural use
⑮	Snap ring	Spring steel
⑯	Tie rod nut R	Rolled steel for general structural use
⑰	Tie rod nut H	Chrome-molybdenum steel
⑱	Lock nut	Rolled steel for general structural use
⑲	Rod end nut	Rolled steel for general structural use
⑳	Seal washer	Nitrile rubber with metal ring
㉑	Rod seal	Synthetic rubber (NBR)
㉒	Piston seal	Synthetic rubber (NBR)
㉓	Cushion seal	Synthetic rubber (NBR)
㉔	Cushion gasket	Synthetic rubber (NBR)
㉕	Tube gasket	Synthetic rubber (NBR)
㉖	Piston gasket	Synthetic rubber (NBR)
㉗	Housing gasket	Synthetic rubber (NBR)

Seals

●Push side stroke adjusting type

Parts	Rod seal	Piston seal	Cushion seal	Tube gasket	Cushion gasket	Piston gasket
Bore size mm \ Quantity	2	1	2	2	2	1
40	DRP16	PWP40N	CPF20	1.5×40	S5	P12
50	DRP20	PWP50N	CPF24	1.5×50	S6	P16
63	DRP20	PWP63N	CPF24	1.5×63	S6	P16
80	DRP25	PWP80N	CPF30	1.5×80	S6	P21
100	DRP30	PWP100N	CPF35	1.5×100	S6	P25

●Pull side stroke adjusting type

Parts	Rod seal	Piston seal	Cushion seal	Tube gasket	Cushion gasket	Piston gasket	Housing gasket	Seal whaser
Bore size mm \ Quantity	1	1	2	2	2	1	1	1
40	DRP16	PWP40N	CPF20	1.5×40	S5	S10	S26	DT1-12
50	DRP20	PWP50N	CPF24	1.5×50	S6	S14	S32	DT1-16
63	DRP20	PWP63N	CPF24	1.5×63	S6	S14	S32	DT1-16
80	DRP25	PWP80N	CPF30	1.5×80	S6	S18	S38	DT1-20
100	DRP30	PWP100N	CPF35	1.5×100	S6	S18	S38	DT1-20

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Mass

●Push side stroke adjusting type

kg

Bore size mm	Mass at zero stroke						Additional mass for each 1mm stroke	Mass of one sensor switch [with holder]		Mass of one knuckle	
	Basic type	Foot mounting type	Axis right angled foot mounting type	Flange mounting type	Trunnion type	Trunnion type (with supporting bracket)		ZC□□□ CS□T Note	CS□F	Y type knuckle (with pin)	I type knuckle
40	1.57	1.70	1.77	1.94	2.05	2.55	0.00457	0.04	0.05	0.27	0.16
50	2.53	2.70	2.85	2.92	3.08	3.58	0.00673			0.34	0.21
63	3.38	3.61	3.90	3.91	4.08	4.58	0.00760	0.04	0.06	0.34	0.21
80	6.10	6.48	6.95	7.70	7.26	7.98	0.01217			0.87	0.62
100	8.45	8.92	9.73	10.67	9.98	10.70	0.01612			1.47	1.24

Note: For lead wire length A (1000mm). Calculation example: For a foot mounting type with bore size of 50mm, and a 100 mm stroke 2.70+(0.00673×100)=3.373kg

●Pull side stroke adjusting type

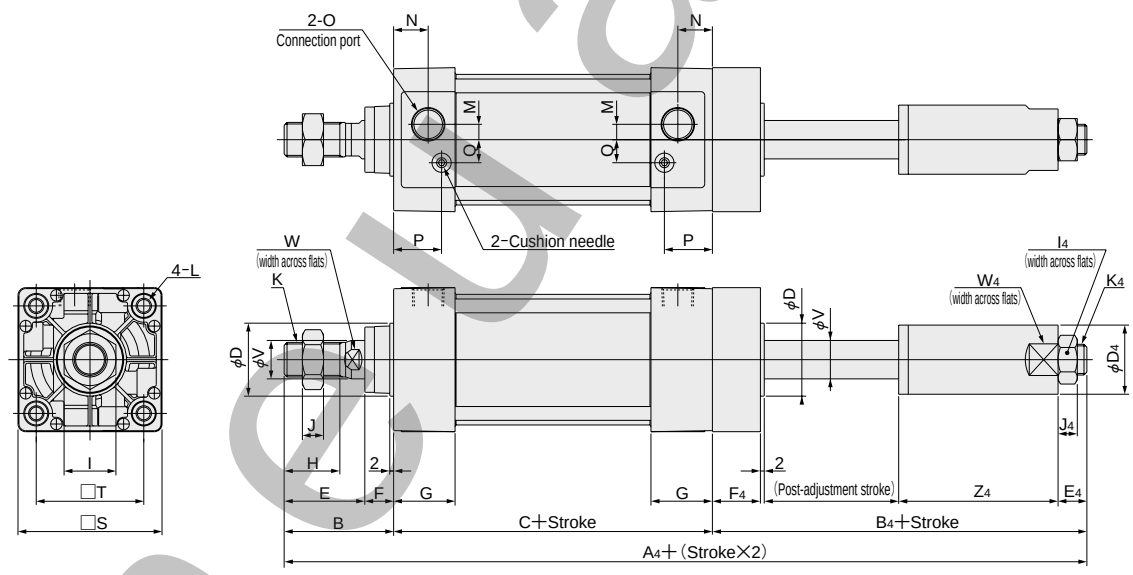
kg

Bore size mm	Mass at zero stroke						Additional mass for each 1mm stroke	Mass of one sensor switch [with holder]		Mass of one knuckle	
	Basic type	Foot mounting type	Axis right angled foot mounting type	Flange mounting type	Trunnion type	Trunnion type (with supporting bracket)		ZC□□□ CS□T Note	CS□F	Y type knuckle (with pin)	I type knuckle
40	1.14	1.27	1.34	1.51	1.62	2.12	0.00300	0.04	0.05	0.27	0.16
50	1.87	2.04	2.19	2.26	2.42	2.92	0.00428			0.34	0.21
63	2.54	2.77	3.06	3.07	3.24	3.74	0.00515	0.04	0.06	0.34	0.21
80	4.67	5.05	5.52	6.27	5.83	6.55	0.00834			0.87	0.62
100	6.35	6.82	7.63	8.57	7.88	8.60	0.01061			1.47	1.24

Note: For lead wire length A (1000mm). Calculation example: For a foot mounting type with bore size of 50mm, and a 100 mm stroke 2.04+(0.00428×100)=2.468kg

Dimensions of Push Side Stroke Adjusting Basic Type (Unit mm)

DDAP Bore size × Stroke



Bore size \ Code	A_4	B	B_4	C	D	D_4	E	E_4	F	F_4	G	H	I	I_4	J
40	254	49	112	93	32	30	34	11	15	25	31	21	22	19	8
50	274	57	124	93	38	36	42	14	15	25	31	29	27	22	11
63	277	57	124	96	38	36	42	14	15	25	32	29	27	22	11
80	321	75	138	108	44	45	54	17	21	35	36	37	32	27	13
100	321	75	138	108	50	50	54	17	21	35	36	37	36	27	14

Bore size \ Code	J_4	K	K_4	L		M	N	O	P	Q	S	T	V	W	W_4	Z_4
40	7	M14×1.5	M12×1.25	M6×1	Depth 14	4	18	Rc1/4	25.5	10	50	37	16	14	27	74
50	10	M18×1.5	M16×1.5	M6×1	Depth 14	7	18	Rc3/8	24	12	62	47	20	17	32	83
63	10	M18×1.5	M16×1.5	M8×1.25	Depth 14	8	18	Rc3/8	25	12	75	56	20	17	32	83
80	12	M22×1.5	M20×1.5	M10×1.5	Depth 15	11	20	Rc1/2	29	16	94	70	25	21	41	84
100	12	M26×1.5	M20×1.5	M10×1.5	Depth 15	12	20	Rc1/2	29	18	112	84	30	26	46	84

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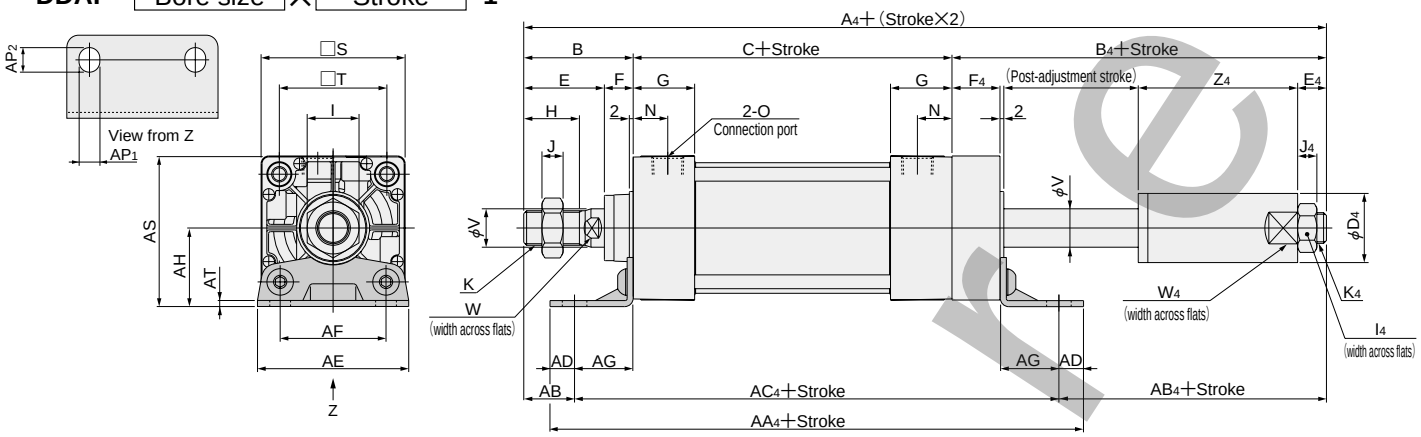
Dimensions of Push Side Stroke Adjusting Foot Mounting Type (Unit mm)

DDAP Bore size × Stroke **-1**

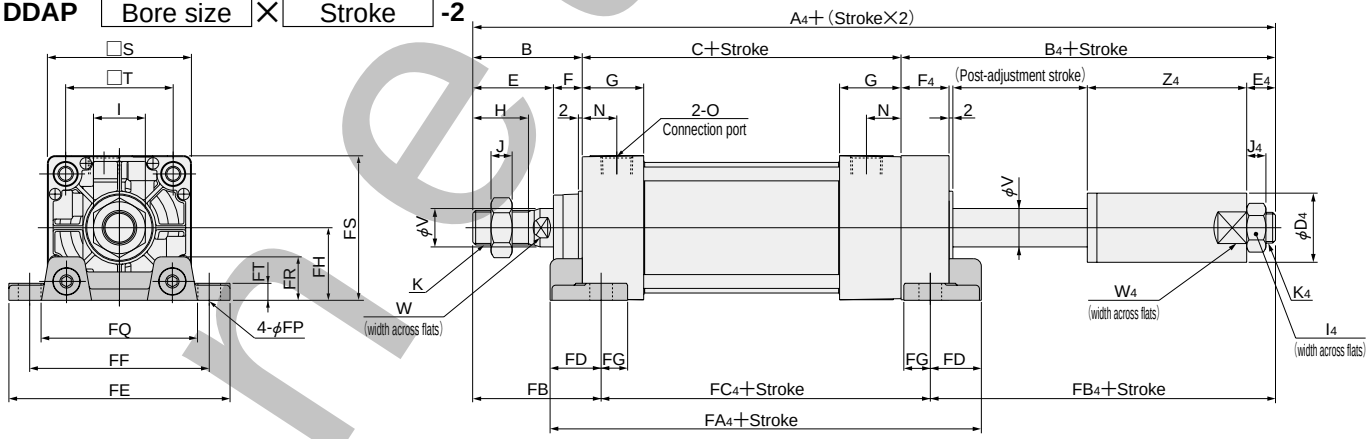


Bore size \ Code	A_4	B	B_4	C	D_4	E	E_4	F	F_4	G	H	I	I_4	J	J_4	K	K_4	N	O
40	254	49	112	93	30	34	11	15	25	31	21	22	19	8	7	M14×1.5	M12×1.25	18	Rc1/4
50	274	57	124	93	36	42	14	15	25	31	29	27	22	11	10	M18×1.5	M16×1.5	18	Rc3/8
63	277	57	124	96	36	42	14	15	25	32	29	27	22	11	10	M18×1.5	M16×1.5	18	Rc3/8
80	321	75	138	108	45	54	17	21	35	36	37	32	27	13	12	M22×1.5	M20×1.5	20	Rc1/2
100	321	75	138	108	50	54	17	21	35	36	37	36	27	14	12	M26×1.5	M20×1.5	20	Rc1/2

Bore size \ Code	S	T	V	W	W_4	Z_4	AA_4	AB	AB_4	AC_4	AD	AE	AF	AG	AH	AP_1	AP_2	AS	AT
40	50	37	16	14	27	74	190	25.5	63.5	165	12.5	57	36	23.5	30	11	13	55	3.2
50	62	47	20	17	32	83	198	29	71	174	12	68	47	28	36.5	11	13	67.5	3.2
63	75	56	20	17	32	83	209	26	68	183	13	80	56	31	41	11	13	78.5	3.2
80	94	70	25	21	41	84	235	45	73	203	16	97	70	30	49	14	16	96	4
100	112	84	30	26	46	84	235	45	73	203	16	112	84	30	57	14	16	113	4

Dimensions of Push Side Stroke Adjusting Axis Right Angled Foot Mounting Type (Unit mm)

DDAP Bore size × Stroke **-2**



Bore size \ Code	A_4	B	B_4	C	D_4	E	E_4	F	F_4	G	H	I	I_4	J	J_4	K	K_4	N	O
40	254	49	112	93	30	34	11	15	25	31	21	22	19	8	7	M14×1.5	M12×1.25	18	Rc1/4
50	274	57	124	93	36	42	14	15	25	31	29	27	22	11	10	M18×1.5	M16×1.5	18	Rc3/8
63	277	57	124	96	36	42	14	15	25	32	29	27	22	11	10	M18×1.5	M16×1.5	18	Rc3/8
80	321	75	138	108	45	54	17	21	35	36	37	32	27	13	12	M22×1.5	M20×1.5	20	Rc1/2
100	321	75	138	108	50	54	17	21	35	36	37	36	27	14	12	M26×1.5	M20×1.5	20	Rc1/2

Bore size \ Code	S	T	V	W	W_4	Z_4	FA_4	FB	FB_4	FC_4	FD	FE	FF	FG	FH	FP	FQ	FR	FS	FT
40	50	37	16	14	27	74	144	59	97	98	23	92	70	14	25	12	58	16	50	8
50	62	47	20	17	32	83	148	67	109	98	25	105	83	14	31	12	68	17	62	9
63	75	56	20	17	32	83	155	67	109	101	27	117	95	14	38	12	84	22	75.5	9
80	94	70	25	21	41	84	185	88	116	117	34	147	121	18	47	14	104	28	94	13
100	112	84	30	26	46	84	193	88	116	117	38	168	140	18	57	14	120	30	113	14

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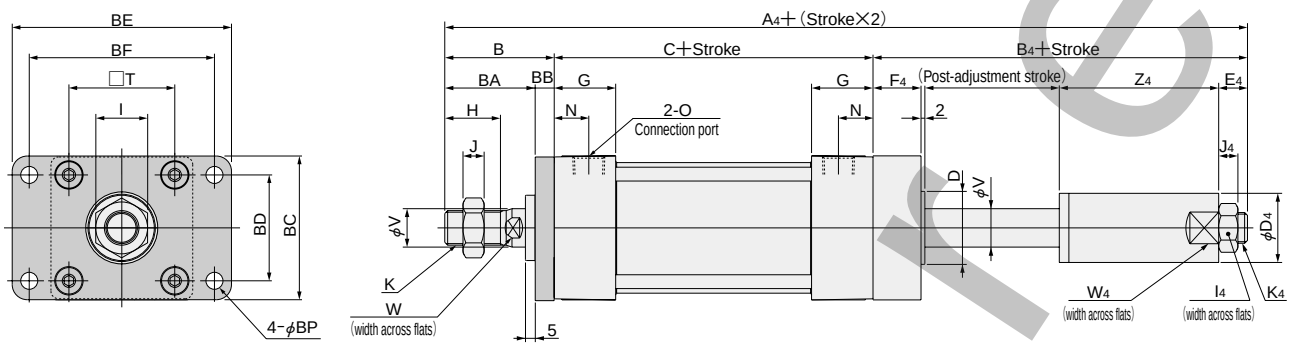
Dimensions of Push Side Stroke Adjusting Rod Side Flange Mounting Type (Unit mm)

DDAP Bore size × Stroke **-3**



Bore size \ Code	A4	B	B4	C	D4	E4	F4	G	H	I	I4	J	J4	K	K4
40	254	49	112	93	30	11	25	31	21	22	19	8	7	M14×1.5	M12×1.25
50	274	57	124	93	36	14	25	31	29	27	22	11	10	M18×1.5	M16×1.5
63	277	57	124	96	36	14	25	32	29	27	22	11	10	M18×1.5	M16×1.5
80	321	75	138	108	45	17	35	36	37	32	27	13	12	M22×1.5	M20×1.5
100	321	75	138	108	50	17	35	36	37	36	27	14	12	M26×1.5	M20×1.5

Bore size \ Code	N	O	T	V	W	W4	Z4	BA	BB	BC	BD	BE	BF	BP
40	18	Rc1/4	37	16	14	27	74	39	10	52	36	84	70	7
50	18	Rc3/8	47	20	17	32	83	47	10	65	47	104	86	9
63	18	Rc3/8	56	20	17	32	83	47	10	76	56	116	98	9
80	20	Rc1/2	70	25	21	41	84	59	16	95	70	143	119	12
100	20	Rc1/2	84	30	26	46	84	59	16	115	84	162	138	12

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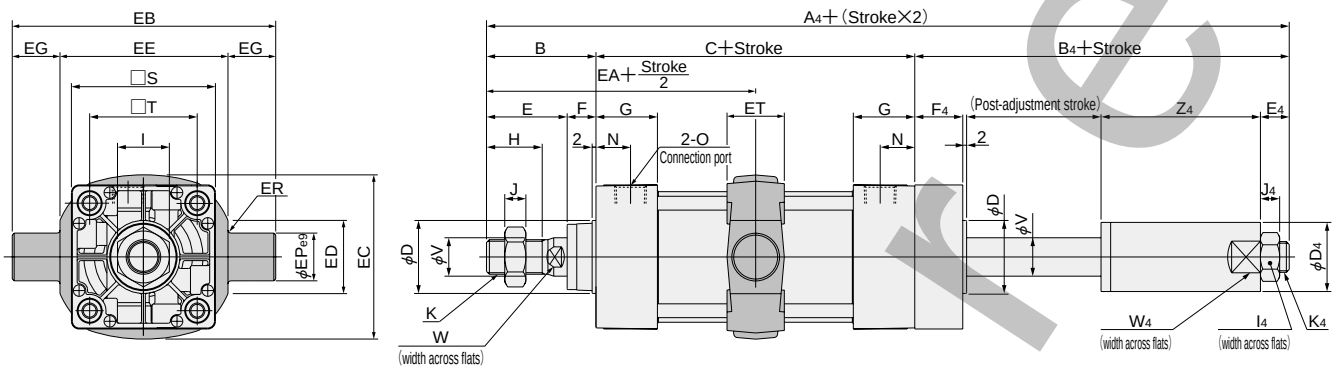
Dimensions of Push Side Stroke Adjusting Trunnion Type (Unit mm)

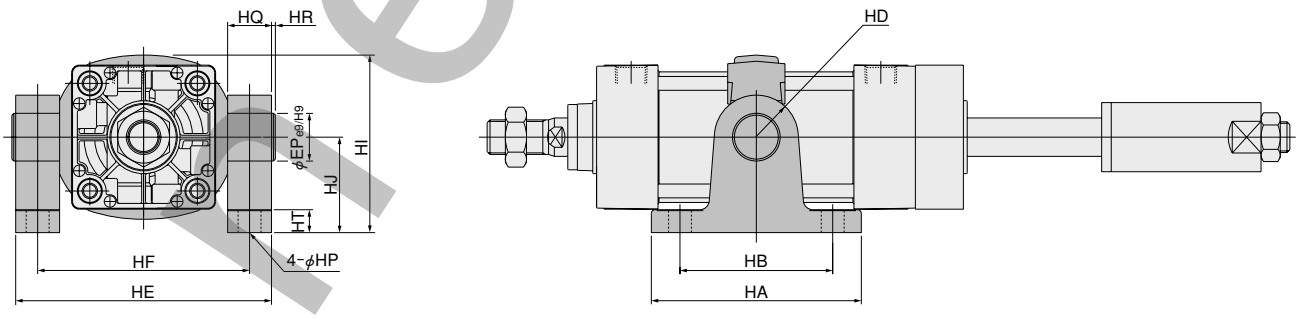
DDAP Bore size × Stroke **-11**



Bore size \ Code	A4	B	B4	C	D	D4	E	E4	F	F4	G	H	I	I4	J	J4	K	K4
40	254	49	112	93	32	30	34	11	15	25	31	21	22	19	8	7	M14×1.5	M12×1.25
50	274	57	124	93	38	36	42	14	15	25	31	29	27	22	11	10	M18×1.5	M16×1.5
63	277	57	124	96	38	36	42	14	15	25	32	29	27	22	11	10	M18×1.5	M16×1.5
80	321	75	138	108	44	45	54	17	21	35	36	37	32	27	13	12	M22×1.5	M20×1.5
100	321	75	138	108	50	50	54	17	21	35	36	37	36	27	14	12	M26×1.5	M20×1.5

Bore size \ Code	N	O	S	T	V	W	W4	Z4	EA	EB	EC	ED	EE	EG	EP	ER	ET
40	18	Rc1/4	50	37	16	14	27	74	95.5	113	60	30	63	25	25	R1.6	30
50	18	Rc3/8	62	47	20	17	32	83	103.5	126	72	30	76	25	25	R1.6	30
63	18	Rc3/8	75	56	20	17	32	83	105	138	87	40	88	25	25	R1.6	30
80	20	Rc1/2	94	70	25	21	41	84	129	164	105	40	114	25	25	R1.6	35
100	20	Rc1/2	112	84	30	26	46	84	129	182	129	44	132	25	25	R2	40

●With Supporting Bracket DDAP Bore size × Stroke **-11-11T**



Bore size \ Code	HA	HB	HD	HE	HF	HI	HJ	HP	HQ	HR	HT	EP
40	111	80	R22	109	86	80	50	12(Thru hole)	23	2	14	25
50	111	80	R22	122	99	86	50	12(Thru hole)	23	2	14	25
63	111	80	R22	134	111	93.5	50	12(Thru hole)	23	2	14	25
80	121	85	R22	160	137	122.5	70	14(Thru hole)	23	2	14	25
100	121	85	R22	178	155	134.5	70	14(Thru hole)	23	2	14	25

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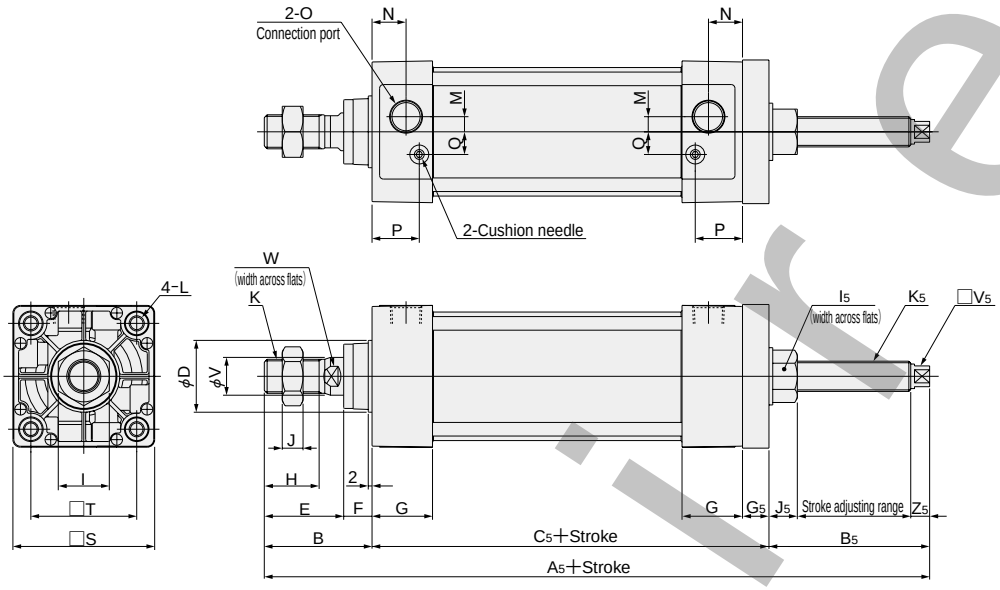
Dimensions of Pull Side Stroke Adjusting Basic Type (Unit mm)

DDAE Bore size × Stroke



Bore size \ Code	A_5	B	B_5	C_5	D	E	F	G	G_5	H	I	I_5	J	J_5	K	K_5
40	238	49	82	107	32	34	15	31	14	21	22	19	8	12	M14×1.5	M12×1.25
50	249	57	85	107	38	42	15	31	14	29	27	24	11	15	M18×1.5	M16×1.5
63	252	57	85	110	38	42	15	32	14	29	27	24	11	15	M18×1.5	M16×1.5
80	296	75	91	130	44	54	21	36	22	37	32	30	13	19	M22×1.5	M20×1.5
100	296	75	91	130	50	54	21	36	22	37	36	30	14	19	M26×1.5	M20×1.5

Bore size \ Code	L	M	N	O	P	Q	S	T	V	V_5	W	Z_5
40	M6×1 Depth 14	4	18	Rc1/4	25.5	10	50	37	16	8	14	10
50	M6×1 Depth 14	7	18	Rc3/8	24	12	62	47	20	11	17	10
63	M8×1.25 Depth 14	8	18	Rc3/8	25	12	75	56	20	11	17	10
80	M10×1.5 Depth 15	11	20	Rc1/2	29	16	94	70	25	14	21	12
100	M10×1.5 Depth 15	12	20	Rc1/2	29	18	112	84	30	14	26	12

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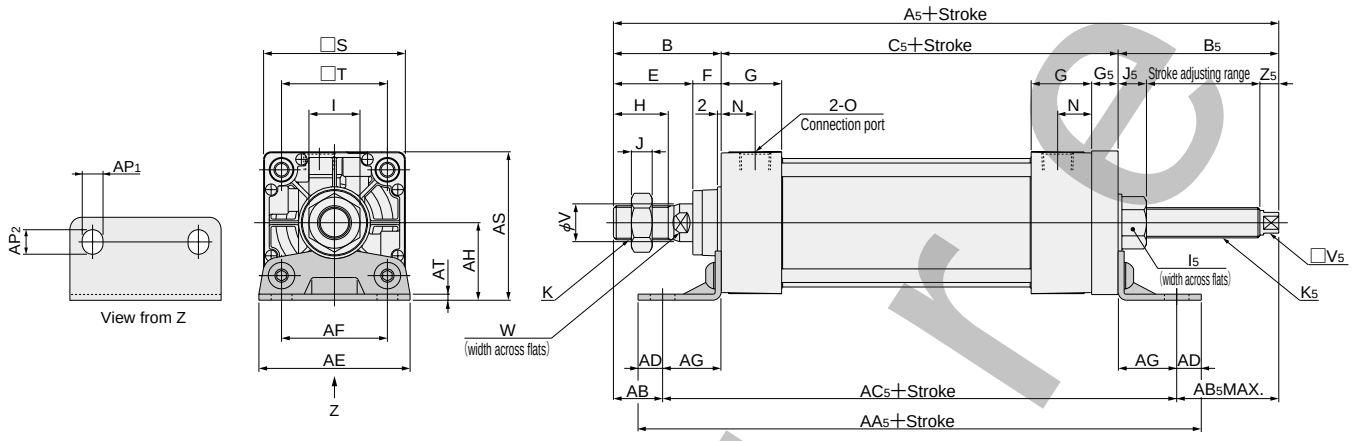
Dimensions of Pull Side Stroke Adjusting Foot Mounting Type (Unit mm)

DDAE Bore size × Stroke **-1**

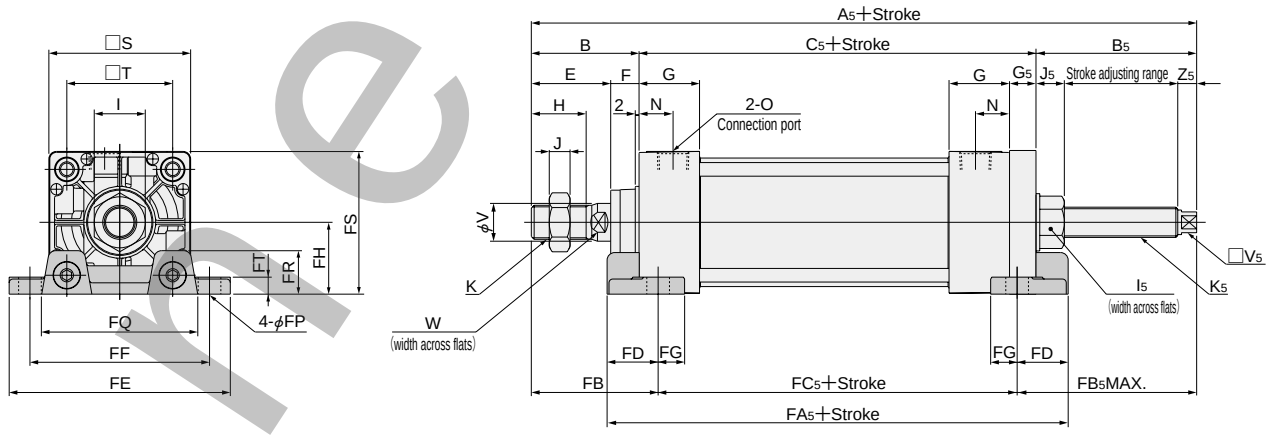


Bore size \ Code	A5	B	B5	C5	E	F	G	G5	H	I	I5	J	J5	K	K5
40	238	49	82	107	34	15	31	14	21	22	19	8	12	M14×1.5	M12×1.25
50	249	57	85	107	42	15	31	14	29	27	24	11	15	M18×1.5	M16×1.5
63	252	57	85	110	42	15	32	14	29	27	24	11	15	M18×1.5	M16×1.5
80	296	75	91	130	54	21	36	22	37	32	30	13	19	M22×1.5	M20×1.5
100	296	75	91	130	54	21	36	22	37	36	30	14	19	M26×1.5	M20×1.5

Bore size \ Code	N	O	S	T	V	V5	W	Z5	AA5	AB	AB5	AC5	AD	AE	AF	AG	AH	AP1	AP2	AS	AT
40	18	Rc1/4	50	37	16	8	14	10	179	25.5	58.5	154	12.5	57	36	23.5	30	11	13	55	3.2
50	18	Rc3/8	62	47	20	11	17	10	187	29	57	163	12	68	47	28	36.5	11	13	67.5	3.2
63	18	Rc3/8	75	56	20	11	17	10	198	26	54	172	13	80	56	31	41	11	13	78.5	3.2
80	20	Rc1/2	94	70	25	14	21	12	222	45	61	190	16	97	70	30	49	14	16	96	4
100	20	Rc1/2	112	84	30	14	26	12	222	45	61	190	16	112	84	30	57	14	16	113	4

Dimensions of Pull Side Stroke Adjusting Axis Right Angled Foot Mounting Type (Unit mm)

DDAE Bore size × Stroke **-2**



Bore size \ Code	A5	B	B5	C5	E	F	G	G5	H	I	I5	J	J5	K	K5
40	238	49	82	107	34	15	31	14	21	22	19	8	12	M14×1.5	M12×1.25
50	249	57	85	107	42	15	31	14	29	27	24	11	15	M18×1.5	M16×1.5
63	252	57	85	110	42	15	32	14	29	27	24	11	15	M18×1.5	M16×1.5
80	296	75	91	130	54	21	36	22	37	32	30	13	19	M22×1.5	M20×1.5
100	296	75	91	130	54	21	36	22	37	36	30	14	19	M26×1.5	M20×1.5

Bore size \ Code	N	O	S	T	V	V5	W	Z5	FA5	FB	FB5	FC5	FD	FE	FF	FG	FH	FP	FQ	FR	FS	FT
40	18	Rc1/4	50	37	16	8	14	10	133	59	92	87	23	92	70	14	25	12	58	16	50	8
50	18	Rc3/8	62	47	20	11	17	10	137	67	95	87	25	105	83	14	31	12	68	17	62	9
63	18	Rc3/8	75	56	20	11	17	10	144	67	95	90	27	117	95	14	38	12	84	22	75.5	9
80	20	Rc1/2	94	70	25	14	21	12	172	88	104	104	34	147	121	18	47	14	104	28	94	13
100	20	Rc1/2	112	84	30	14	26	12	180	88	104	104	38	168	140	18	57	14	120	30	113	14

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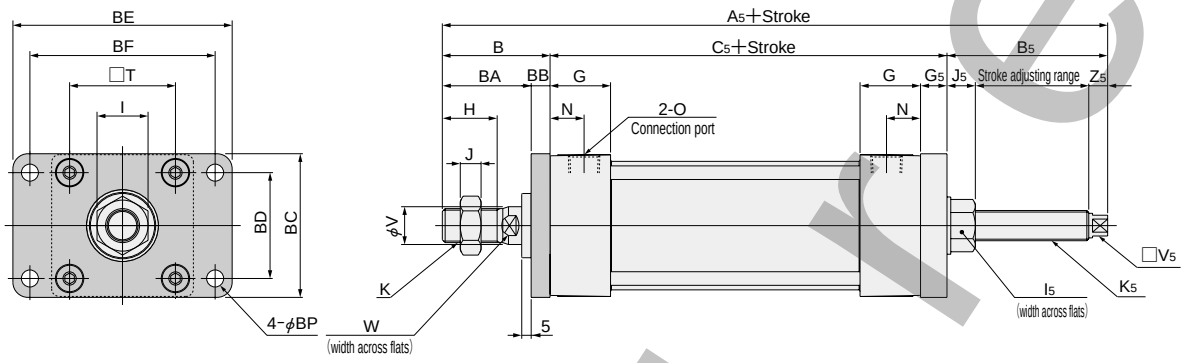
Dimensions of Pull Side Stroke Adjusting Rod Side Flange Mounting Type (Unit mm)

DDAE Bore size × Stroke **-3**



Bore size \ Code	A_5	B	B_5	C_5	G	G_5	H	I	I_5	J	J_5	K	K_5
40	238	49	82	107	31	14	21	22	19	8	12	M14×1.5	M12×1.25
50	249	57	85	107	31	14	29	27	24	11	15	M18×1.5	M16×1.5
63	252	57	85	110	32	14	29	27	24	11	15	M18×1.5	M16×1.5
80	296	75	91	130	36	22	37	32	30	13	19	M22×1.5	M20×1.5
100	296	75	91	130	36	22	37	36	30	14	19	M26×1.5	M20×1.5

Bore size \ Code	N	O	T	V	V_5	W	Z_5	BA	BB	BC	BD	BE	BF	BP
40	18	Rc1/4	37	16	8	14	10	39	10	52	36	84	70	7
50	18	Rc3/8	47	20	11	17	10	47	10	65	47	104	86	9
63	18	Rc3/8	56	20	11	17	10	47	10	76	56	116	98	9
80	20	Rc1/2	70	25	14	21	12	59	16	95	70	143	119	12
100	20	Rc1/2	84	30	14	26	12	59	16	115	84	162	138	12

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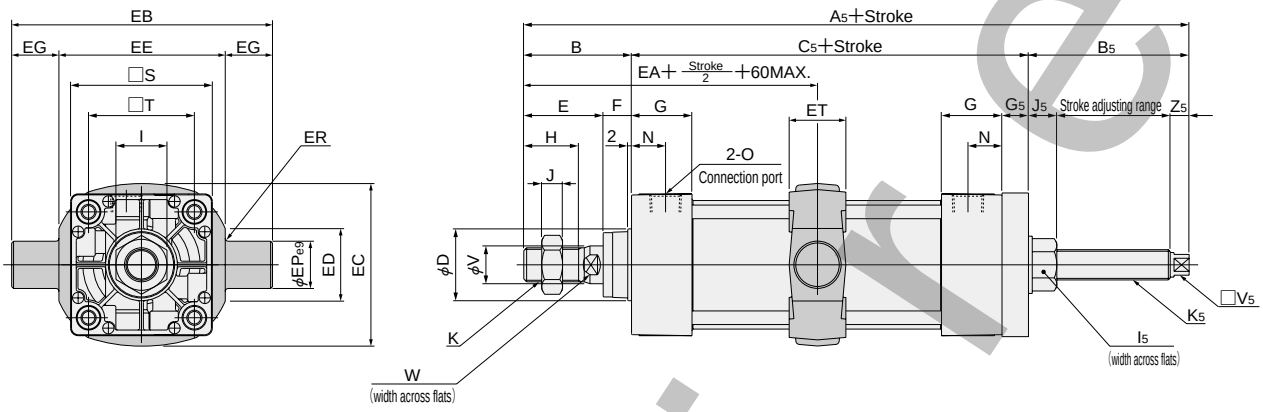
Dimensions of Pull Side Stroke Adjusting Trunnion Type (Unit mm)

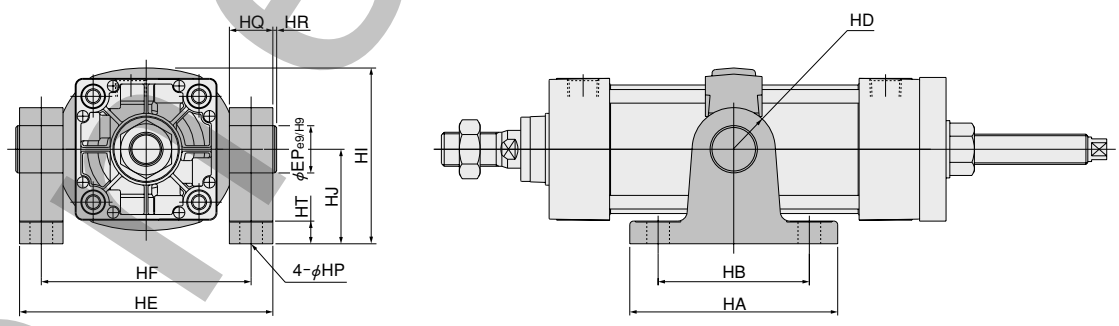
DDAE Bore size × Stroke **-11**



Bore size \ Code	A_5	B	B_5	C_5	D	E	F	G	G_5	H	I	I_5	J	J_5	K	K_5
40	238	49	82	107	32	34	15	31	14	21	22	19	8	12	M14×1.5	M12×1.25
50	249	57	85	107	38	42	15	31	14	29	27	24	11	15	M18×1.5	M16×1.5
63	252	57	85	110	38	42	15	32	14	29	27	24	11	15	M18×1.5	M16×1.5
80	296	75	91	130	44	54	21	36	22	37	32	30	13	19	M22×1.5	M20×1.5
100	296	75	91	130	50	54	21	36	22	37	36	30	14	19	M26×1.5	M20×1.5

Bore size \ Code	N	O	S	T	V	V_5	W	Z_5	EA	EB	EC	ED	EE	EG	EP	ER	ET
40	18	Rc1/4	50	37	16	8	14	10	95.5	113	60	30	63	25	25	R1.6	30
50	18	Rc3/8	62	47	20	11	17	10	103.5	126	72	30	76	25	25	R1.6	30
63	18	Rc3/8	75	56	20	11	17	10	105	138	87	40	88	25	25	R1.6	30
80	20	Rc1/2	94	70	25	14	21	12	129	164	105	40	114	25	25	R1.6	35
100	20	Rc1/2	112	84	30	14	26	12	129	182	129	44	132	25	25	R2	40

●With Supporting Bracket DDAE Bore size × Stroke **-11-11T**



Bore size \ Code	HA	HB	HD	HE	HF	HI	HJ	HP	HQ	HR	HT	EP
40	111	80	R22	109	86	80	50	12(Thru hole)	23	2	14	25
50	111	80	R22	122	99	86	50	12(Thru hole)	23	2	14	25
63	111	80	R22	134	111	93.5	50	12(Thru hole)	23	2	14	25
80	121	85	R22	160	137	122.5	70	14(Thru hole)	23	2	14	25
100	121	85	R22	178	155	134.5	70	14(Thru hole)	23	2	14	25

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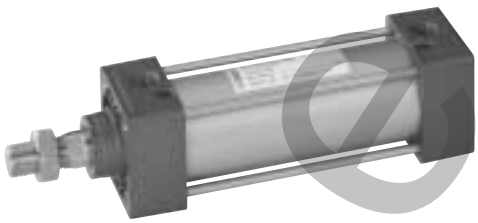
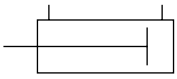
NEW DYNA Low Hydraulic Cylinders



Symbol



Specifications

Item \ Bore size mm	32	40	50	63	80	100
Operating method	Double acting type					
Media	Turbine oil with antifoaming agent (ISO VG22～100 or equivalent) or petroleum-based hydraulic oil					
Mounting type	Basic type, Foot mounting type, Axis right angled foot mounting type, Rod side flange mounting type, Head side flange mounting type, Clevis mounting type, Pivot mounting type, Trunnion type					
Operating pressure range MPa {kgf/cm²}	0.2～1.0 {2.0～10.2}					
Proof pressure MPa {kgf/cm²}	1.5 {15.3}					
Operating temperature range °C	0～60					
Operating speed range mm/s	1～150					
Cushion	None					
Port size Rc	1/8	1/4	3/8		1/2	

Bore Size and Stroke

mm

Bore size	Standard stroke	Maximum potential manufacturing stroke
32	50, 75, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700	700
40	50, 75, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700	1000
50	800	1500
63	50, 75, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700 800, 900, 1000	1500
80		
100		

Remarks: 1. Stroke tolerance: Strokes of 250 or less are $^{+1}_{0}$, strokes of 251～1000 are $^{+1.5}_{0}$, and strokes of 1001 or more are $^{+2.0}_{0}$.
2. For non-standard strokes, consult us.
3. For the maximum potential manufacturing stroke with bellows specification, see p.104.

Order Code

DDA □ **50×100** – □ – □ – □ – □□ □ □

NEW DYNA Cylinders
Basic model

Bore size
×
Stroke

Cylinder specification
H —— Low hydraulic cylinders
HJ —— Low hydraulic cylinders with bellows

Types of bellows
JT —— Nylon tarpaulin (～80˚C)
JC —— Chloroprene (～100˚C)
JK —— Cornex (～200˚C)
JA —— Arumix (～250˚C)
●Cornex is a registered trademark of Teijin, Inc.
●The temperature shown is the bellows own durable temperature, and is not a temperature for cylinder use.

Mounting type
Blank — Basic type
1 —— Foot mounting type
2 —— Axis right angled foot mounting type
3 —— Rod side flange mounting type
5 —— Head side flange mounting type
7 —— Clevis mounting type (with pin)
7-7C — Clevis mounting type (with supporting brackets)
8 —— Pivot mounting type
11 —— Trunnion type
11-11T — Trunnion type (with supporting bracket)
●Mounting brackets are included at time of delivery, with the exception of the trunnion type.
●Orders for mounting brackets only are also accepted.

Sensor switch (for cylinder with magnet)

ZC130 —	2-lead wires	Solid state type	with indicator lamp	DC10～28V
ZC153 —	3-lead wires	Solid state type	with indicator lamp	DC4.5～28V
CS5T —	2-lead wires	Reed switch type	without indicator lamp	DC5～28V AC85～115V
CS11T —	2-lead wires	Reed switch type	with indicator lamp	DC10～28V
CS2F —	DIN type	Reed switch type	with indicator lamp	AC85～230V
CS3F —	DIN type	Reed switch type	with indicator lamp	DC10～30V
CS4F —	DIN type	Reed switch type	with indicator lamp	DC10～30V
CS5F —	DIN type	Reed switch type	without indicator lamp	DC3～30V

●For sensor switch specifications, see p.97, while for mountings, see p.101.
●**CS□F** comes with a DIN connector. All others are grommet type.
●Orders for sensor switches only are also accepted.

Rod end mounting
Blank — Without rod end mounting
Y —— With Y type knuckle (with pin)
I —— With I type knuckle
●Place separate orders for the cylinder joint and cylinder rod end.
●Orders for rod end mountings only are also accepted.
●For rod end mountings dimensions, see p.105.

Lead wire length
(Applicable to **ZC,CS□T type**)
A : 1000mm
B : 3000mm

Number of sensor switches
1 — With one sensor switch
2 — With two sensor switches
⋮ ⋮
n — With n sensor switches

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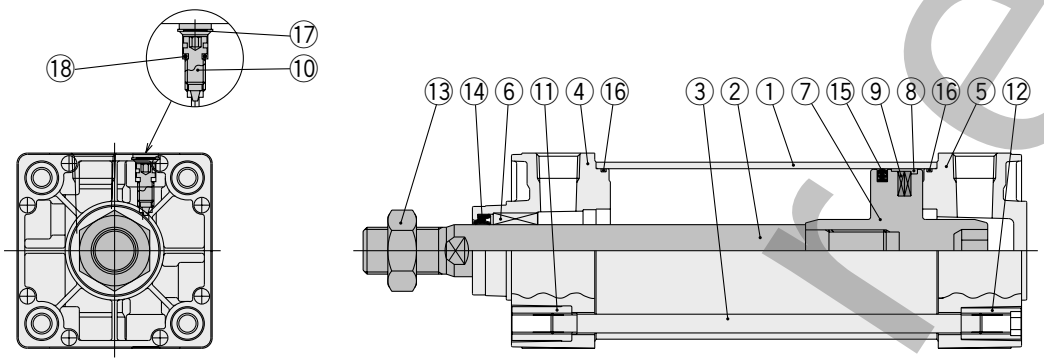
Inner Construction and Major Parts



Major Parts and Materials

No.	Parts	Materials
①	Cylinder tube	Aluminum alloy
②	Piston rod	Carbon steel for machine structural use
③	Tie rod	Carbon steel for machine structural use
④	Rod cover	Aluminum die-cast
⑤	Head cover	Aluminum die-cast
⑥	Rod bushing	Oil-permeated sintered copper alloy
⑦	Piston	Aluminum alloy
⑧	Wear ring	Plastic
⑨	Magnet	Rubber magnet

No.	Parts	Materials
⑩	Plug	Carbon steel for machine structural use
⑪	Tie rod nut R	Rolled steel for general structural use
⑫	Tie rod nut H	Chrome-molybdenum steel
⑬	Rod end nut	Rolled steel for general structural use
⑭	Rod seal	Synthetic rubber (NBR)
⑮	Piston seal	Synthetic rubber (NBR)
⑯	Tube gasket	Synthetic rubber (NBR)
⑰	Snap ring	Spring steel
⑱	Plug gasket	Synthetic rubber (NBR)

Seals

Parts / Bore size mm \ Quantity	Rod seal	Piston seal	Tube gasket	Plug gasket
	2	1	2	2
32	NHU-12	OSD-32A	1.5×32	S5
40	NHU-16	OSD-40A	1.5×40	S5
50	NHU-20	OSD-50A	1.5×50	S6
63	NHU-20	OSD-63A	1.5×63	S6
80	NHU-25	OSD-80A	1.5×80	S6
100	NHU-30	OSD-100A	1.5×100	S6

Mass

kg

Bore size mm	Mass at zero stroke									Additional mass for each 1mm stroke	Mass of one sensor switch [with holder]		Mass of knuckle	
	Basic type	Foot mounting type	Axis right angled foot mounting type	Flange mounting type	Clevis mounting type (with pin)	Clevis mounting type (with supporting bracket)	Pivot mounting type	Trunnion type	Trunnion type (with supporting bracket)		ZC□□□	CS□F	Y type knuckle (with pin)	I type knuckle
32	0.57	0.68	0.71	0.77	0.76	1.22	0.69	0.87	1.09	0.00218	0.04	0.05	0.22	0.16
40	0.65	0.78	0.85	1.02	0.92	1.62	0.83	1.13	1.63	0.00300			0.27	0.16
50	1.02	1.19	1.34	1.41	1.41	2.11	1.28	1.57	2.07	0.00428			0.34	0.21
63	1.36	1.59	1.88	1.89	1.84	3.54	1.78	2.06	2.56	0.00515	0.04	0.06	0.34	0.21
80	2.32	2.70	3.17	3.92	3.24	3.96	3.40	3.48	4.20	0.00834			0.87	0.62
100	2.94	3.41	4.22	5.16	4.18	4.90	4.33	4.47	5.19	0.01061			1.47	1.24

Note: For lead wire length A (1000mm).

Calculation example: For a foot mounting type with bore size of 50mm, and a 100mm stroke
1.19＋(0.00428×100)＝1.618kg

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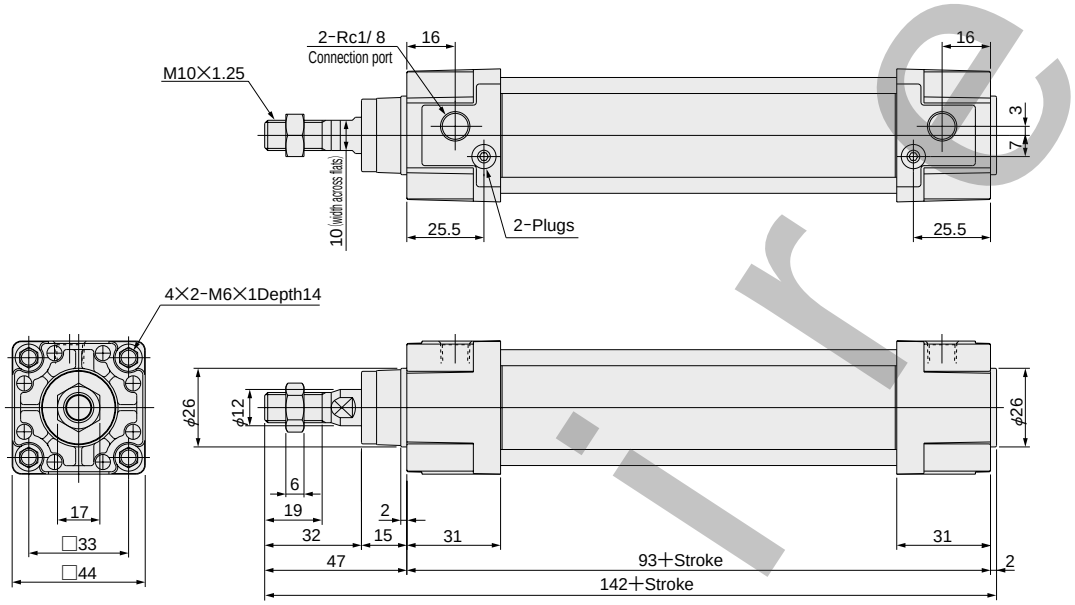
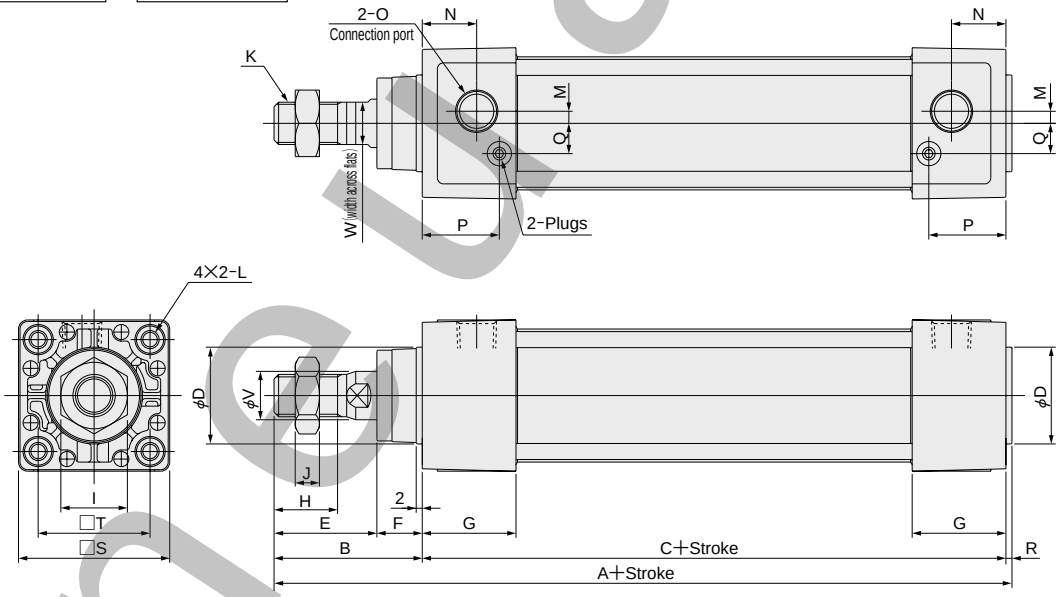
Dimensions of Basic Type (Unit mm)

DDAH 32× Stroke



DDAH Bore size × Stroke



Bore size \ Code	A	B	C	D	E	F	G	H	I	J	K	L
40	144	49	93	32	34	15	31	21	22	8	M14×1.5	M 6×1 Depth 14
50	152	57	93	38	42	15	31	29	27	11	M18×1.5	M 6×1 Depth 14
63	155	57	96	38	42	15	32	29	27	11	M18×1.5	M 8×1.25 Depth 14
80	185	75	108	44	54	21	36	37	32	13	M22×1.5	M10×1.5 Depth 15
100	185	75	108	50	54	21	36	37	36	14	M26×1.5	M10×1.5 Depth 15

Bore size \ Code	M	N	O	P	Q	R	S	T	V	W	Y
40	4	18	Rc1/4	25.5	10	2	50	37	16	14	2.5
50	7	18	Rc3/8	24	12	2	62	47	20	17	3
63	8	18	Rc3/8	25	12	2	75	56	20	17	3
80	11	20	Rc1/2	29	16	2	94	70	25	21	3
100	12	20	Rc1/2	29	18	2	112	84	30	26	3

Preview

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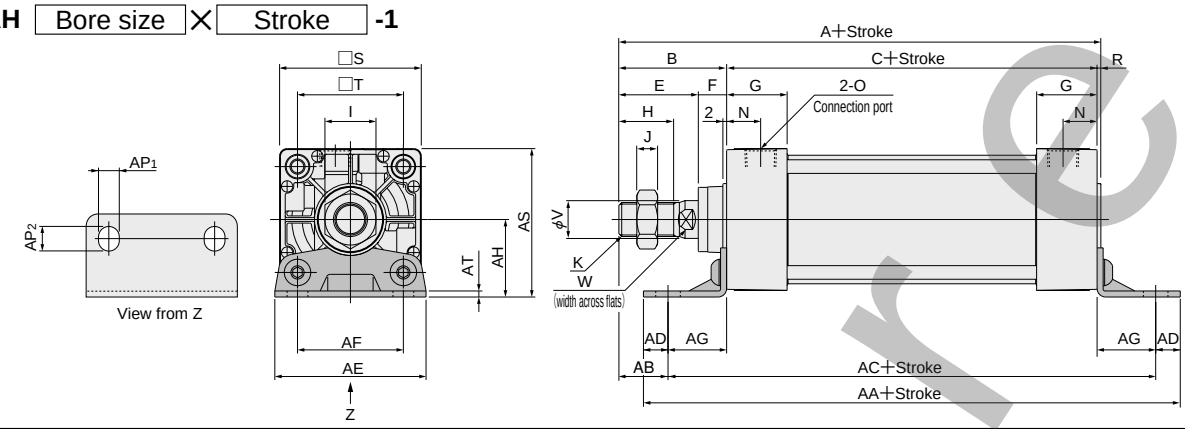
Dimensions of Foot Mounting Type (Unit mm)

DDAH Bore size × Stroke **-1**

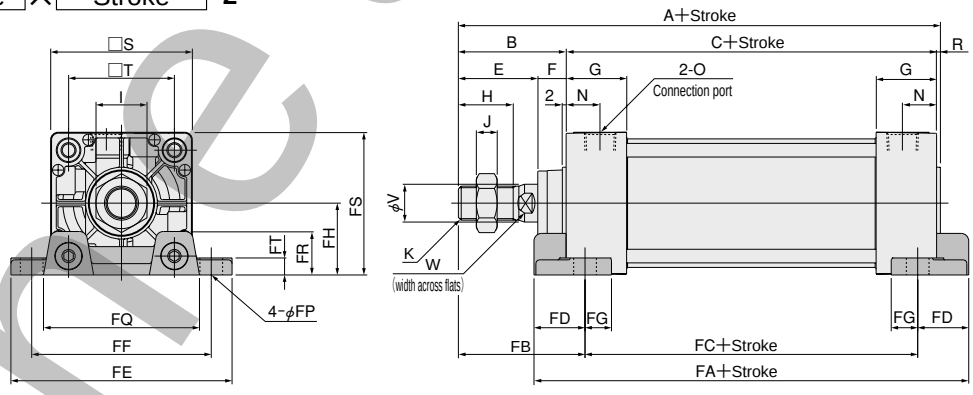


Bore size \ Code	A	B	C	E	F	G	H	I	J	K	N	O	R	S	T	V	W
32	142	47	93	32	15	31	19	17	6	M10×1.25	16	Rc1/8	2	44	33	12	10
40	144	49	93	34	15	31	21	22	8	M14×1.5	18	Rc1/4	2	50	37	16	14
50	152	57	93	42	15	31	29	27	11	M18×1.5	18	Rc3/8	2	62	47	20	17
63	155	57	96	42	15	32	29	27	11	M18×1.5	18	Rc3/8	2	75	56	20	17
80	185	75	108	54	21	36	37	32	13	M22×1.5	20	Rc1/2	2	94	70	25	21
100	185	75	108	54	21	36	37	36	14	M26×1.5	20	Rc1/2	2	112	84	30	26

Bore size \ Code	AA	AB	AC	AD	AE	AF	AG	AH	AP_1	AP_2	AS	AT
32	153	26.5	134	9.5	50	33	20.5	28	9	11	50	3.2
40	165	25.5	140	12.5	57	36	23.5	30	11	13	55	3.2
50	173	29	149	12	68	47	28	36.5	11	13	67.5	3.2
63	184	26	158	13	80	56	31	41	11	13	78.5	3.2
80	200	45	168	16	97	70	30	49	14	16	96	4
100	200	45	168	16	112	84	30	57	14	16	113	4

Dimensions of Axis Right Angled Foot Mounting Type (Unit mm)

DDAH Bore size × Stroke **-2**



Bore size \ Code	A	B	C	E	F	G	H	I	J	K	N	O	R	S	T	V	W
32	142	47	93	32	15	31	19	17	6	M10×1.25	16	Rc1/8	2	44	33	12	10
40	144	49	93	34	15	31	21	22	8	M14×1.5	18	Rc1/4	2	50	37	16	14
50	152	57	93	42	15	31	29	27	11	M18×1.5	18	Rc3/8	2	62	47	20	17
63	155	57	96	42	15	32	29	27	11	M18×1.5	18	Rc3/8	2	75	56	20	17
80	185	75	108	54	21	36	37	32	13	M22×1.5	20	Rc1/2	2	94	70	25	21
100	185	75	108	54	21	36	37	36	14	M26×1.5	20	Rc1/2	2	112	84	30	26

Bore size \ Code	FA	FB	FC	FD	FE	FF	FG	FH	FP	FQ	FR	FS	FT
32	119	57	73	23	81	63	14	22	9	54	14	44	8
40	119	59	73	23	92	70	14	25	12	58	16	50	8
50	123	67	73	25	105	83	14	31	12	68	17	62	9
63	130	67	76	27	117	95	14	38	12	84	22	75.5	9
80	150	88	82	34	147	121	18	47	14	104	28	94	13
100	158	88	82	38	168	140	18	57	14	120	30	113	14

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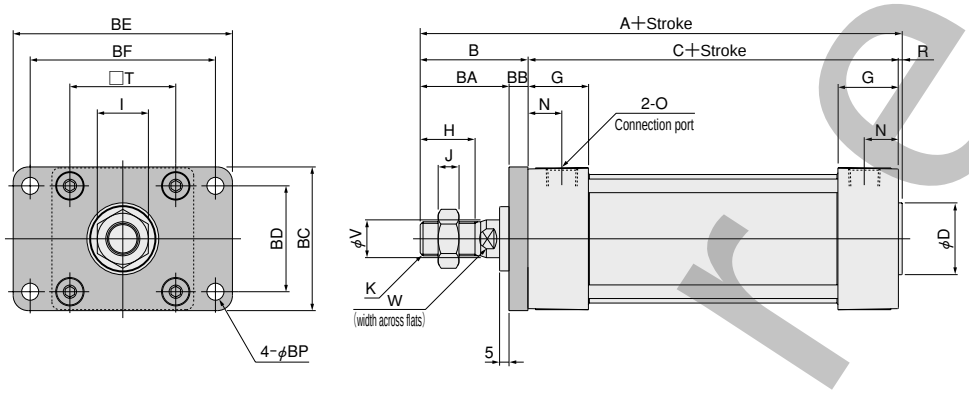
Dimensions of Rod Side Flange Mounting Type (Unit mm)

DDAH Bore size × Stroke **-3**

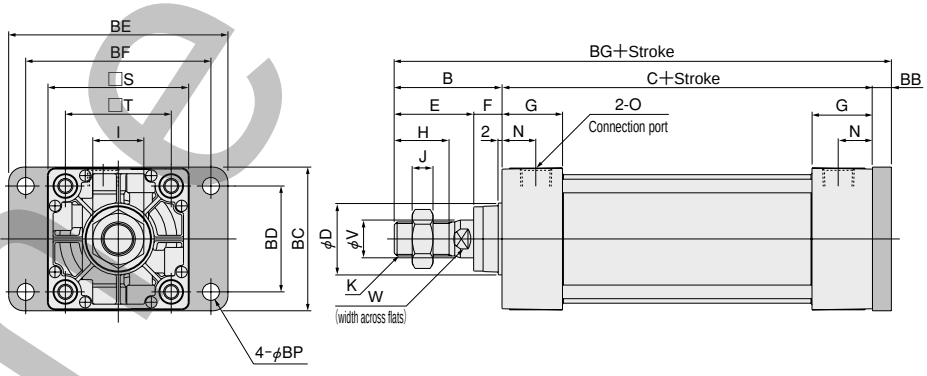


Bore size \ Code	A	B	C	D	G	H	I	J	K	N	O	R	T	V	W
32	142	47	93	26	31	19	17	6	M10×1.25	16	Rc1/8	2	33	12	10
40	144	49	93	32	31	21	22	8	M14×1.5	18	Rc1/4	2	37	16	14
50	152	57	93	38	31	29	27	11	M18×1.5	18	Rc3/8	2	47	20	17
63	155	57	96	38	32	29	27	11	M18×1.5	18	Rc3/8	2	56	20	17
80	185	75	108	44	36	37	32	13	M22×1.5	20	Rc1/2	2	70	25	21
100	185	75	108	50	36	37	36	14	M26×1.5	20	Rc1/2	2	84	30	26

Bore size \ Code	BA	BB	BC	BD	BE	BF	BP
32	37	10	47	33	72	58	7
40	39	10	52	36	84	70	7
50	47	10	65	47	104	86	9
63	47	10	76	56	116	98	9
80	59	16	95	70	143	119	12
100	59	16	115	84	162	138	12

Dimensions of Head Side Flange Mounting Type (Unit mm)

DDAH Bore size × Stroke **-5**



Bore size \ Code	B	C	D	E	F	G	H	I	J	K	N	O	S	T	V	W
32	47	93	26	32	15	31	19	17	6	M10×1.25	16	Rc1/8	44	33	12	10
40	49	93	32	34	15	31	21	22	8	M14×1.5	18	Rc1/4	50	37	16	14
50	57	93	38	42	15	31	29	27	11	M18×1.5	18	Rc3/8	62	47	20	17
63	57	96	38	42	15	32	29	27	11	M18×1.5	18	Rc3/8	75	56	20	17
80	75	108	44	54	21	36	37	32	13	M22×1.5	20	Rc1/2	94	70	25	21
100	75	108	50	54	21	36	37	36	14	M26×1.5	20	Rc1/2	112	84	30	26

Bore size \ Code	BB	BC	BD	BE	BF	BG	BP
32	10	47	33	72	58	150	7
40	10	52	36	84	70	152	7
50	10	65	47	104	86	160	9
63	10	76	56	116	98	163	9
80	16	95	70	143	119	199	12
100	16	115	84	162	138	199	12

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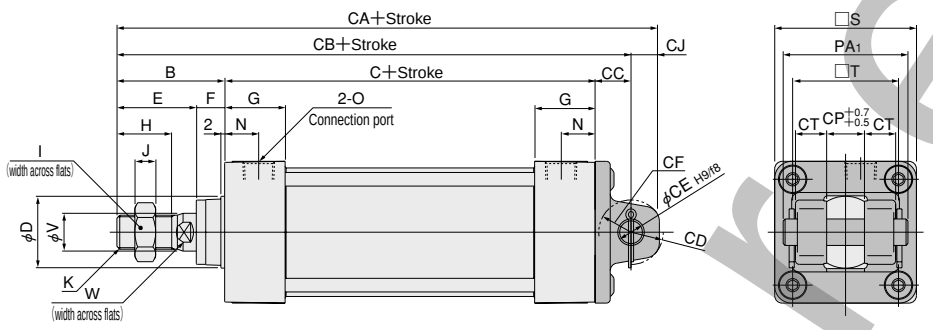
Dimensions of Clevis Mounting Type (Unit mm)

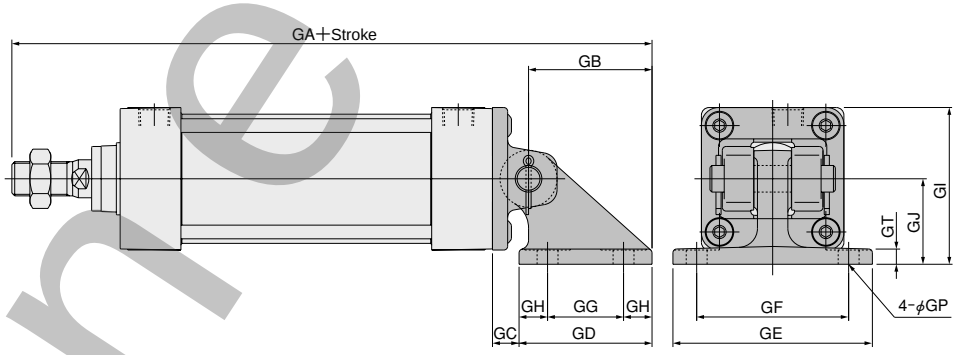
DDAH Bore size × Stroke **-7**



Bore size \ Code	B	C	D	E	F	G	H	I	J	K	N	O	S	T	V	W
32	47	93	26	32	15	31	19	17	6	M10×1.25	16	Rc1/8	44	33	12	10
40	49	93	32	34	15	31	21	22	8	M14×1.5	18	Rc1/4	50	37	16	14
50	57	93	38	42	15	31	29	27	11	M18×1.5	18	Rc3/8	62	47	20	17
63	57	96	38	42	15	32	29	27	11	M18×1.5	18	Rc3/8	75	56	20	17
80	75	108	44	54	21	36	37	32	13	M22×1.5	20	Rc1/2	94	70	25	21
100	75	108	50	54	21	36	37	36	14	M26×1.5	20	Rc1/2	112	84	30	26

Bore size \ Code	CA	CB	CC	CD	CE	CF	CJ	CP	CT	PA1
32	172	159	19	R15	12	R17	13	16	8.5	46
40	174	161	19	R15	14	R17	13	20	12.5	58
50	184	169	19	R17	14	R17	15	20	16.5	66
63	187	172	19	R17	14	R17	15	20	16.5	66
80	236	215	32	R24	20	R30	21	32	17.5	78
100	236	215	32	R24	20	R30	21	32	17.5	78

●With Supporting Bracket DDAH Bore size × Stroke **-7-7C**



Bore size \ Code	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GP	GT
32	215.5	56.5	12.5	63	85	65	40	11.5	57	35	9(Thru hole)	8
40	227.5	66.5	12.5	73	105	80	40	16.5	70	45	11(Thru hole)	8
50	235.5	66.5	12.5	73	105	80	40	16.5	76	45	11(Thru hole)	8
63	238.5	66.5	12.5	73	105	80	40	16.5	82.5	45	11(Thru hole)	8
80	301.5	86.5	20.5	98	135	105	65	16.5	107	60	14(Thru hole)	12
100	301.5	86.5	20.5	98	135	105	65	16.5	116	60	14(Thru hole)	12

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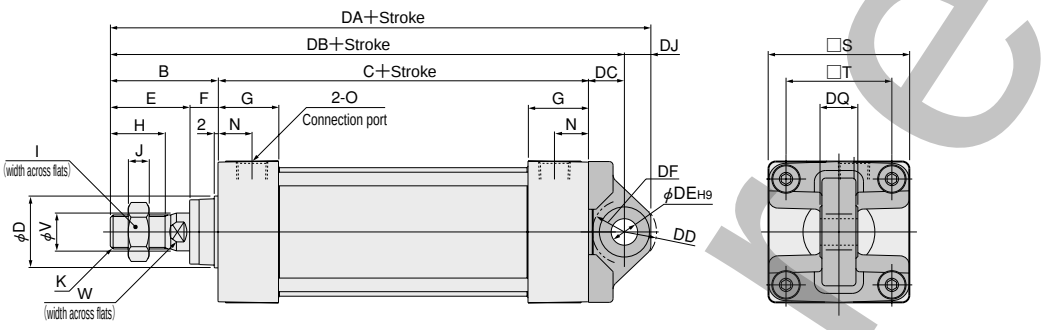
Dimensions of Pivot Mounting Type (Unit mm)

DDAH Bore size × Stroke **-8**



Bore size \ Code	B	C	D	E	F	G	H	I	J	K	N	O	S	T	V	W
32	47	93	26	32	15	31	19	17	6	M10×1.25	16	Rc1/8	44	33	12	10
40	49	93	32	34	15	31	21	22	8	M14×1.5	18	Rc1/4	50	37	16	14
50	57	93	38	42	15	31	29	27	11	M18×1.5	18	Rc3/8	62	47	20	17
63	57	96	38	42	15	32	29	27	11	M18×1.5	18	Rc3/8	75	56	20	17
80	75	108	44	54	21	36	37	32	13	M22×1.5	20	Rc1/2	94	70	25	21
100	75	108	50	54	21	36	37	36	14	M26×1.5	20	Rc1/2	112	84	30	26

Bore size \ Code	DA	DB	DC	DD	DE	DF	DJ	DQ
32	172	159	19	R16	12	R16	13	$16\ ^{0}_{-0.070}$
40	175	161	19	R17	14	R17	14	$20\ ^{0}_{-0.084}$
50	183	169	19	R17	14	R17	14	$20\ ^{0}_{-0.084}$
63	186	172	19	R17	14	R17	14	$20\ ^{0}_{-0.084}$
80	236	215	32	R24	20	R25	21	$32\ ^{0}_{-0.100}$
100	235	215	32	R24	20	R26	20	$32\ ^{0}_{-0.100}$

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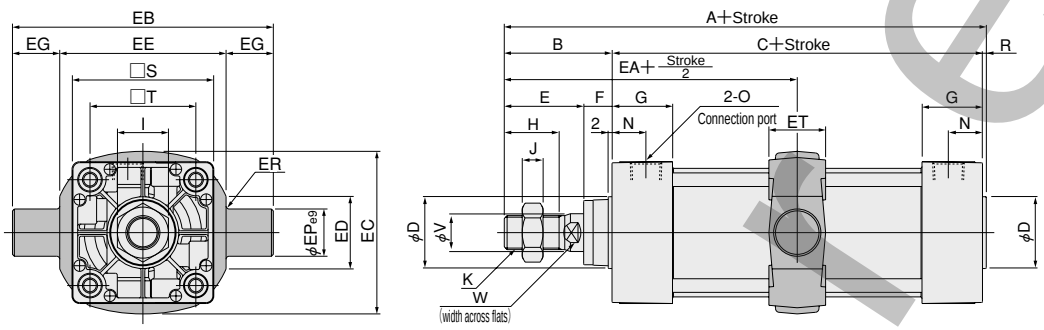
Dimensions of Trunnion Type (Unit mm)

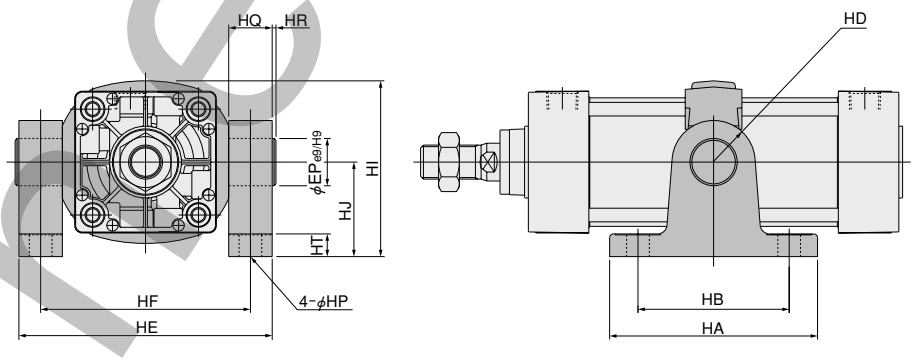
DDAH Bore size × Stroke **-11**



Bore size \ Code	A	B	C	D	E	F	G	H	I	J	K	N	O	R	S	T	V	W
32	142	47	93	26	32	15	31	19	17	6	M10×1.25	16	Rc1/8	2	44	33	12	10
40	144	49	93	32	34	15	31	21	22	8	M14×1.5	18	Rc1/4	2	50	37	16	14
50	152	57	93	38	42	15	31	29	27	11	M18×1.5	18	Rc3/8	2	62	47	20	17
63	155	57	96	38	42	15	32	29	27	11	M18×1.5	18	Rc3/8	2	75	56	20	17
80	185	75	108	44	54	21	36	37	32	13	M22×1.5	20	Rc1/2	2	94	70	25	21
100	185	75	108	50	54	21	36	37	36	14	M26×1.5	20	Rc1/2	2	112	84	30	26

Bore size \ Code	EA	EB	EC	ED	EE	EG	EP	ER	ET
32	93.5	87	53	20	55	16	16	R1	30
40	95.5	113	60	30	63	25	25	R1.6	30
50	103.5	126	72	30	76	25	25	R1.6	30
63	105	138	87	40	88	25	25	R1.6	30
80	129	164	105	40	114	25	25	R1.6	35
100	129	182	129	44	132	25	25	R2	40

●With Supporting Bracket DDAH Bore size × Stroke **-11-11T**



Bore size \ Code	HA	HB	HD	HE	HF	HI	HJ	HP	HQ	HR	HT	EP
32	81	60	R16	85	70	66.5	40	9(Thru hole)	15	1	12	16
40	111	80	R22	109	86	80	50	12(Thru hole)	23	2	14	25
50	111	80	R22	122	99	86	50	12(Thru hole)	23	2	14	25
63	111	80	R22	134	111	93.5	50	12(Thru hole)	23	2	14	25
80	121	85	R22	160	137	122.5	70	14(Thru hole)	23	2	14	25
100	121	85	R22	178	155	134.5	70	14(Thru hole)	23	2	14	25

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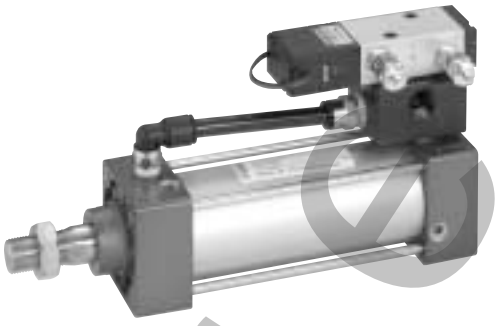
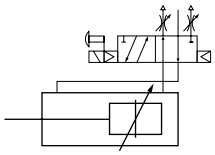
NEW DYNA Valpack Cylinders



Symbol



Specifications

Item \ Bore size mm	40	50	63	80	100
Operating method	Double acting type				
Media	Air				
Mounting type	Basic type, Foot mounting type, Axis right angled foot mounting type, Rod side flange mounting type, Head side flange mounting type, Clevis mounting type, Pivot mounting type, Trunnion type				
Operating pressure range MPa{kgf/cm²}	0.17～0.7 {1.7～7.1}				
Proof pressure MPa{kgf/cm²}	1.05 {10.7}				
Operating temperature range °C	5～50				
Operating speed range mm/s	50～500				50～300
Speed controller	Exhaust throttle valve (two-way) is standard equipment				
Cushion stroke mm	16	20		25	
Lubrication	Not required (But if you must use lubrication, use Turbine oil Class 1 (ISO VG32) or equivalent)				
Port size Rc	3/8				

Bore size and Stroke

mm

Bore sizer	Standard stroke	Maximum potential manufacturing stroke
40	50[Note 1], 75, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800	1000
50	50[Note 1], 75, 100, 150, 200, 250, 300, 350, 400 450, 500, 600, 700, 800, 900, 1000	1500
63		
80		
100		

Remarks: 1. Stroke tolerance: Strokes of 250 or less are $^{+1}_{0}$, strokes of 251～1000 are $^{+1.5}_{0}$, and strokes of 1001 or more are $^{+2.0}_{0}$.
2. For non-standard strokes, consult us.
3. Cylinders with magnet are not available in steel tube specifications.
4. For the maximum potential manufacturing stroke with bellows specification, see p. 104.

Note: 1. Not available for trunnion type.

Solenoid Valve Specifications

Item \ Series / Solenoid specifications / Type	
Series	**350**series
Solenoid specifications	Single
Type	**VP350-4E1-70**
Operating method	Indirect operation
Number of postions and ports	2 positions, 5 ports
Effective area [Cv] mm²	26.5[1.47]
Port size Rc	1/4
Lubrication	Not required
Operating pressure range MPa{kgf/cm²}	0.17～0.7 {1.7～7.1}
Proof pressure MPa{kgf/cm²}	1.1 {10.2}
Operating temperature range °C	5～50
Shock resistance G	90
Mounting direction	Any
Maximum operating frequency c/s	5

Solenoid Specifications

Item \ Rated voltage		AC100V		AC200V		DC24V
Type		Shading type				Built-in flywheel diode for surge suppression
Operating voltage range V		90～132 (100^{+30}_{-10}%)		180～264 (200^{+32}_{-10}%)		21.6～26.4 (24±10%)
Current (At rated voltage applied)	Frequency Hz	50	60	50	60	—
	Starting mA(r.m.s.)	34	32	17	16	—
	Energizing mA(r.m.s.)	22	20	11	10	65(1.6W)
Maximum allowable leakage current mA		4		2		4
Insulation type		B type				
Insulation resistance MΩ		Min. 100				
Wiring and lead wire length		Grommet type: 300mm				
Color of lead wire		Yellow		White		Red(+),Black(−)
Surge suppression		Built-in varistor (made to order)				Flywheel diode (standard equipment)

Order Code

DDV □ **50×100** − □ − □ − □ − □ − **AC100V** − □ □ □

NEW DYNA Valpack cylinders

Bore size × Stroke

Blank − Without bellows
J — With bellows

Types of bellows
JT — Nylon tarpaulin (～80˚C)
JC — Chloroprene (～100˚C)
JK — Cornex (～200˚C)
JA — Arumix (～250˚C)
●Cornex is a registered trademark of Teijin, Inc.
●The temperature shown is the bellows own durable temperature, and is not a temperature for cylinder use.

Tube material
Blank — Standard
FT — Steel tube specification (Not available for cylinder with magnet.)

Mounting type
Blank — Basic type
1 — Foot mounting type
2 — Axis right angled foot mounting type
3 — Rod side flange mounting type
5 — Head side flange mounting type
7 — Clevis mounting type (with pin)
7-7C — Clevis mounting type (with supporting brackets)
8 — Pivot mounting type
11 — Trunnion type
11-11T — Trunnion type (with supporting bracket)
●Mounting brackets are included at time of delivery, with the exception of the trunnion type.
●Orders for mounting brackets only are also accepted.

Voltage
AC100V
AC200V
DC24V
●Single unit valve order code **VP350-4E1-70-Voltage**
●2 pcs. standard speed controllers are included.

Rod end mounting
Blank — Without rod end mounting
Y — With Y type knuckle (with pin)
I — With I type knuckle
●Place separate orders for the cylinder joint and cylinder rod end.
●Orders for rod end mounting only are also accepted.
●For rod end mounting dimensions, see p.105.

Sensor switch (for cylinder with magnet)

ZC130	2-lead wires	Solid state type	with indicator lamp	DC10～28V
ZC153	3-lead wires	Solid state type	with indicator lamp	DC4.5～28V
CS5T	2-lead wires	Reed switch type	without indicator lamp	DC5～28V, AC85～115V
CS11T	2-lead wires	Reed switch type	with indicator lamp	DC10～28V
CS2F	DIN type	Reed switch type	with indicator lamp	AC85～230V
CS3F	DIN type	Reed switch type	with indicator lamp	DC10～30V
CS4F	DIN type	Reed switch type	with indicator lamp	DC10～30V
CS5F	DIN type	Reed switch type	without indicator lamp	DC3～30V

●For sensor switch specifications, see p.97, while for mountings, see p.101.
●**CS□F** comes with a DIN connector. All others are grommet type.
●Orders for sensor switches only are also accepted.

Lead wire length
A — 1000mm
B — 3000mm

Number of sensor switches
1 — With one sensor switch
2 — With two sensor switches
⋮ ⋮
n — With n sensor switches

Remarks: 1. The order code for the valpack valve only is **VP350-4E1-70-Voltage**.
2. For made to order valves, or for double solenoid, 3-position, locking type manual override, plug connector, DIN connector, or LED indicator, consult us.

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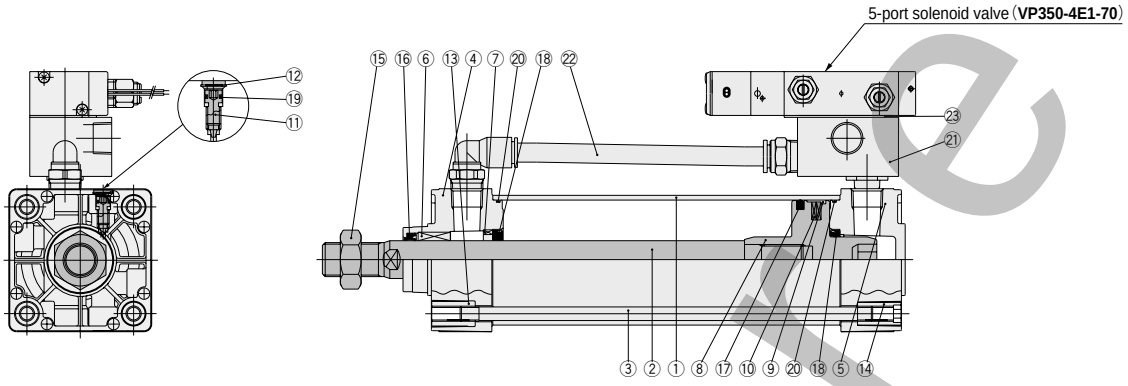
Inner Construction and Major Parts



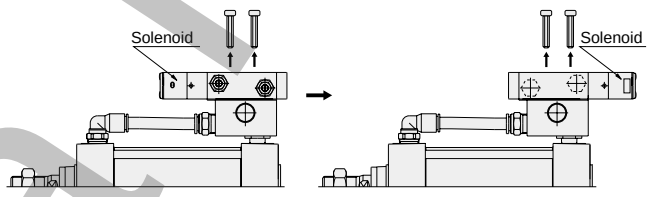
Seals

Parts	Rod Seal	Piston Seal	Cushion Seal	Tube gasket	Cushion gasket
Bore size mm / Quantity	1★	1★	2	2★	2
40	DRP16	PWP40N	CPF20	1.5×40	S5
50	DRP20	PWP50N	CPF24	1.5×50	S6
63	DRP20	PWP63N	CPF24	1.5×63	S6
80	DRP25	PWP80N	CPF30	1.5×80	S6
100	DRP30	PWP100N	CPF35	1.5×100	S6

Remark: Starred ★ designate items available as repair kits.
Order code
For standard cylinders⋯**SRK-NDDA** Bore size

Switching from Push to Pull Type Cylinder in Energizing

Push type cylinder in energizing **Pull type cylinder in energizing**



Remove the valve mounting screws, turn the valve 180˚, and re-assemble. At this time, confirm that the valve adapter gasket is in the designated position between the valve and the valve adapter.

Major Parts and Materials

No.	Parts	Materials
①	Cylinder tube	Aluminum alloy, and steel tube specifications are high carbon steel
②	Piston rod	φ32:Stainless steel, φ40~φ125:Carbon steel for machine structural use
③	Tie rod	Carbon steel for machine structural use
④	Rod cover	Aluminum die-cast
⑤	Head cover	Aluminum die-cast
⑥	Rod bushing	Oil-permeated sintered copper alloy
⑦	Keep ring	Aluminum alloy
⑧	Piston	Aluminum alloy
⑨	Wear ring	Plastic
⑩	Magnet	Rubber magnet
⑪	Cushion needle	Carbon steel for machine structural use
⑫	Snap ring	Spring steel
⑬	Tie rod nut R	Rolled steel for general structural use
⑭	Tie rod nut H	Chrome-molybdenum steel
⑮	Rod end nut	Rolled steel for general structural use
⑯	Rod seal	Synthetic rubber (NBR)

No.	Parts	Materials
⑰	Piston seal	Synthetic rubber (NBR)
⑱	Cushion seal	Synthetic rubber (NBR)
⑲	Cushion gasket	Synthetic rubber (NBR)
⑳	Tube gasket	Synthetic rubber (NBR)
㉑	Valve adapter	Aluminum alloy
㉒	Bypass tube	Nylon tube
㉓	Valve adapter gasket	Synthetic rubber (NBR)
—	Foot bracket	Rolled steel for general structural use
—	Axial right angled foot bracket	Cast iron
—	Flange mounting bracket	Rolled steel for general structural use
—	Clevis mounting bracket	Cast iron
—	Clevis supporting bracket	Cast iron
—	Pivot bracket	Cast iron
—	Trunnion bracket	Cast iron
—	Trunnion supporting bracket	Cast iron
—	Knuckles	Cast iron

Mass

kg

Bore size mm	Mass at zero stroke									Additional mass for each 1mm stroke	Mass of one sensor switch [with holder]		Mass of knuckle	
	Basic type	Foot mounting type	Axis right angled foot mounting type	Flange mounting type	Clevis mounting type (with pin)	Clevis mounting type (with supporting bracket)	Pivot mounting type	Trunnion type	Trunnion type (with supporting bracket)		ZC□□□ CS□□T Note	CS□F	Y type knuckle (with pin)	I type knuckle
40	0.89 (0.93)	1.02 (1.06)	1.09 (1.13)	1.26 (1.30)	1.16 (1.20)	1.86 (1.90)	1.07 (1.11)	1.37 (1.41)	1.87 (1.91)	0.00300 (0.0073)	0.04	0.05	0.27	0.16
50	1.26 (1.32)	1.43 (1.49)	1.58 (1.64)	1.65 (1.71)	1.65 (1.71)	2.35 (2.41)	1.52 (1.58)	1.81 (1.87)	2.31 (2.37)	0.00428 (0.01068)			0.34	0.21
63	1.61 (1.69)	1.84 (1.92)	2.13 (2.21)	2.14 (2.22)	2.09 (2.17)	2.79 (2.87)	2.03 (2.11)	2.31 (2.39)	2.81 (2.89)	0.00515 (0.01285)	0.04	0.06	0.34	0.21
80	2.15 (2.32)	2.53 (2.70)	3.00 (3.17)	3.75 (3.92)	3.07 (3.24)	3.79 (3.96)	3.23 (3.40)	3.31 (3.48)	4.03 (4.20)	0.00834 (0.02134)			0.87	0.62
100	3.22 (3.43)	3.69 (3.90)	4.50 (4.71)	5.44 (5.65)	4.46 (4.67)	5.18 (5.39)	4.61 (4.82)	4.75 (4.96)	5.47 (5.68)	0.01061 (0.02701)			1.47	1.24

Note: For lead wire length A (1000mm).
Remark: Figures in parentheses ( ) are for steel tube specifications.

Calculation example: For a foot mounting type with bore size of 50mm, and a 100mm stroke
1.43+(0.00428×100)=1.858kg

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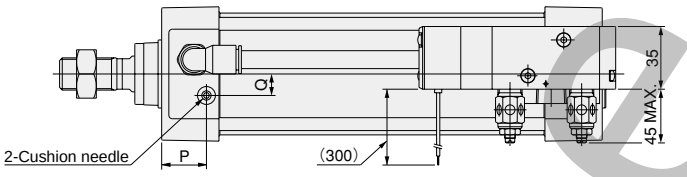
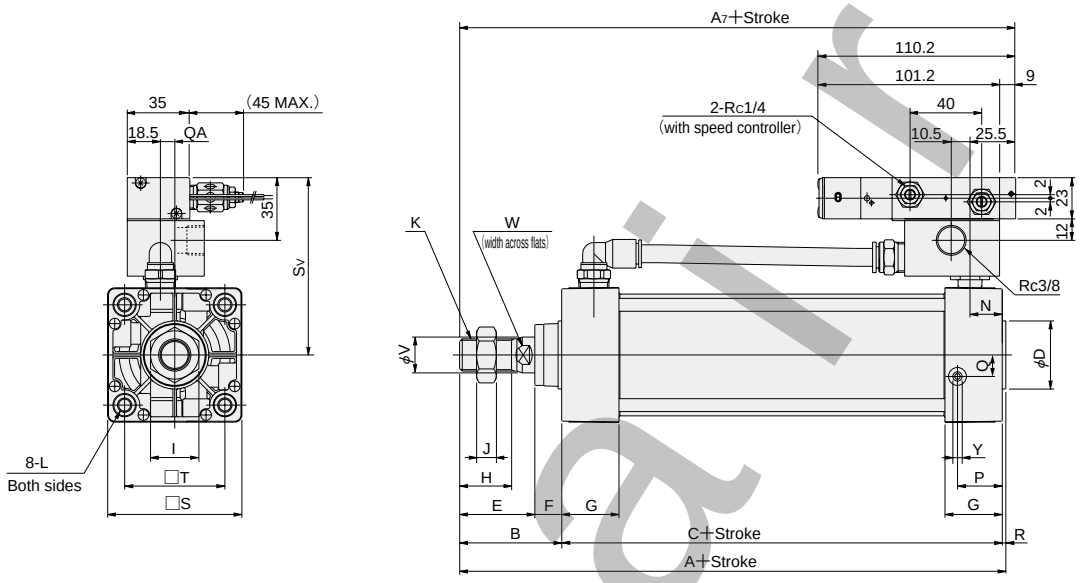
Dimensions of Basic Type (Unit mm)

DDV Bore size × Stroke





Bore size \ Code	A	A_7	B	C	D	E	F	G	H	I	J	K
40	144	149.5	49	93	32	34	15	31	21	22	8	M14×1.5
50	152	157.5	57	93	38	42	15	31	29	27	11	M18×1.5
63	155	160.5	57	96	38	42	15	32	29	27	11	M18×1.5
80	185	188.5	75	108	44	54	21	36	37	32	13	M22×1.5
100	185	188.5	75	108	50	54	21	36	37	36	14	M26×1.5

Bore size \ Code	L	N	P	Q	Q_A	R	S	S_V	T	V	W	Y
40	M6×1 Depth 14	18	25.5	10	4	2	50	(86.5)	37	16	14	2.5
50	M6×1 Depth 14	18	24	12	7	2	62	(92.5)	47	20	17	3
63	M8×1.25 Depth 14	18	25	12	8	2	75	(99)	56	20	17	3
80	M10×1.5 Depth 15	20	29	16	11	2	94	(108.5)	70	25	21	3
100	M10×1.5 Depth 15	20	29	18	12	2	112	(117.5)	84	30	26	3

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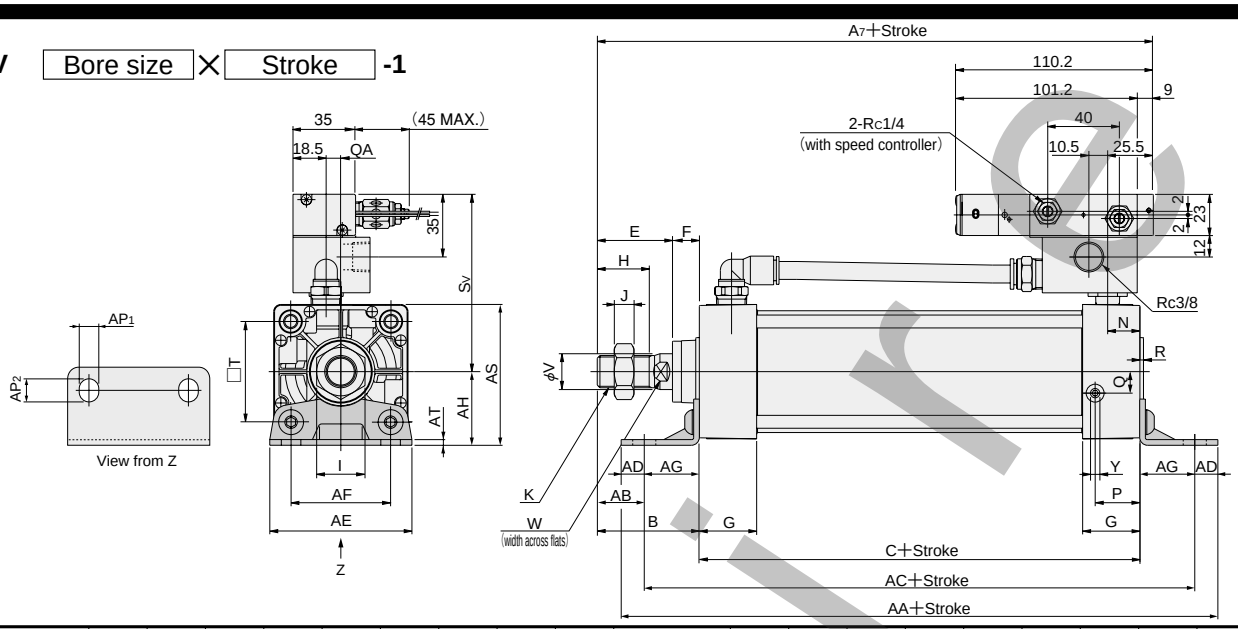
Dimensions of Foot Mounting Type (Unit mm)

DDV Bore size × Stroke **-1**

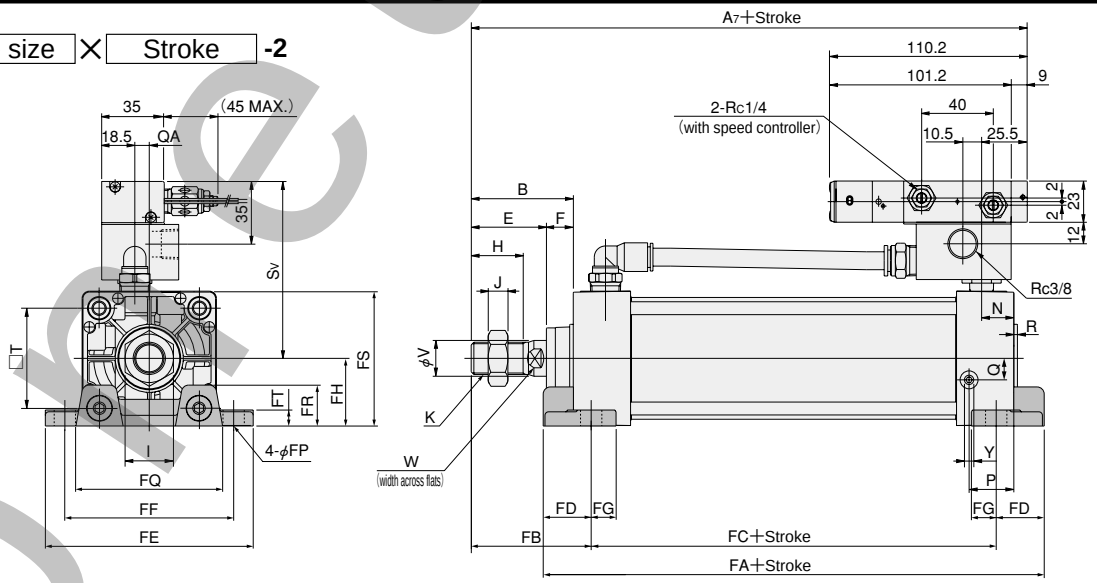


Bore size \ Code	A7	B	C	E	F	G	H	I	J	K	N	P	Q	QA	R	SV	T	V	W	Y
40	149.5	49	93	34	15	31	21	22	8	M14×1.5	18	25.5	10	4	2	(86.5)	37	16	14	2.5
50	157.5	57	93	42	15	31	29	27	11	M18×1.5	18	24	12	7	2	(92.5)	47	20	17	3
63	160.5	57	96	42	15	32	29	27	11	M18×1.5	18	25	12	8	2	(99)	56	20	17	3
80	188.5	75	108	54	21	36	37	32	13	M22×1.5	20	29	16	11	2	(108.5)	70	25	21	3
100	188.5	75	108	54	21	36	37	36	14	M26×1.5	20	29	18	12	2	(117.5)	84	30	26	3

Bore size \ Code	AA	AB	AC	AD	AE	AF	AG	AH	AP1	AP2	AS	AT
40	165	25.5	140	12.5	57	36	23.5	30	11	13	55	3.2
50	173	29	149	12	68	47	28	36.5	11	13	67.5	3.2
63	184	26	158	13	80	56	31	41	11	13	78.5	3.2
80	200	45	168	16	97	70	30	49	14	16	96	4
100	200	45	168	16	112	84	30	57	14	16	113	4

Dimensions of Axis Right Angled Foot Mounting Type (Unit mm)

DDV Bore size × Stroke **-2**



Bore size \ Code	A7	B	E	F	H	I	J	K	N	P	Q	QA	R	SV	T	V	W	Y
40	149.5	49	34	15	21	22	8	M14×1.5	18	25.5	10	4	2	(86.5)	37	16	14	2.5
50	157.5	57	42	15	29	27	11	M18×1.5	18	24	12	7	2	(92.5)	47	20	17	3
63	160.5	57	42	15	29	27	11	M18×1.5	18	25	12	8	2	(99)	56	20	17	3
80	188.5	75	54	21	37	32	13	M22×1.5	20	29	16	11	2	(108.5)	70	25	21	3
100	188.5	75	54	21	37	36	14	M26×1.5	20	29	18	12	2	(117.5)	84	30	26	3

Bore size \ Code	FA	FB	FC	FD	FE	FF	FG	FH	FP	FQ	FR	FS	FT
40	119	59	73	23	92	70	14	25	12	58	16	50	8
50	123	67	73	25	105	83	14	31	12	68	17	62	9
63	130	67	76	27	117	95	14	38	12	84	22	75.5	9
80	150	88	82	34	147	121	18	47	14	104	28	94	13
100	158	88	82	38	168	138	18	57	14	120	30	113	14

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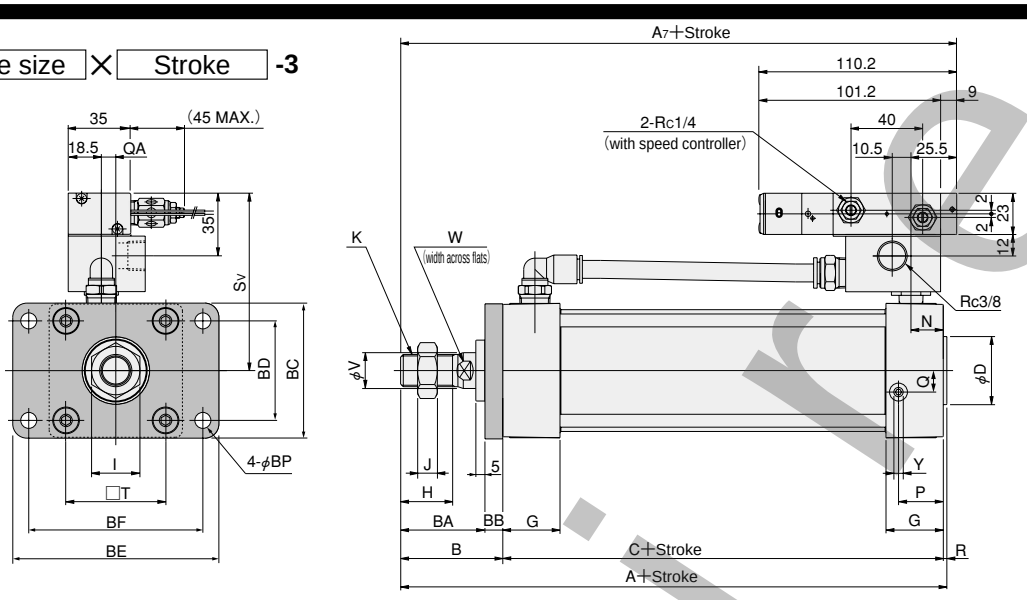
Dimensions of Rod Side Flange Mounting Type (Unit mm)

DDV Bore size × Stroke **-3**

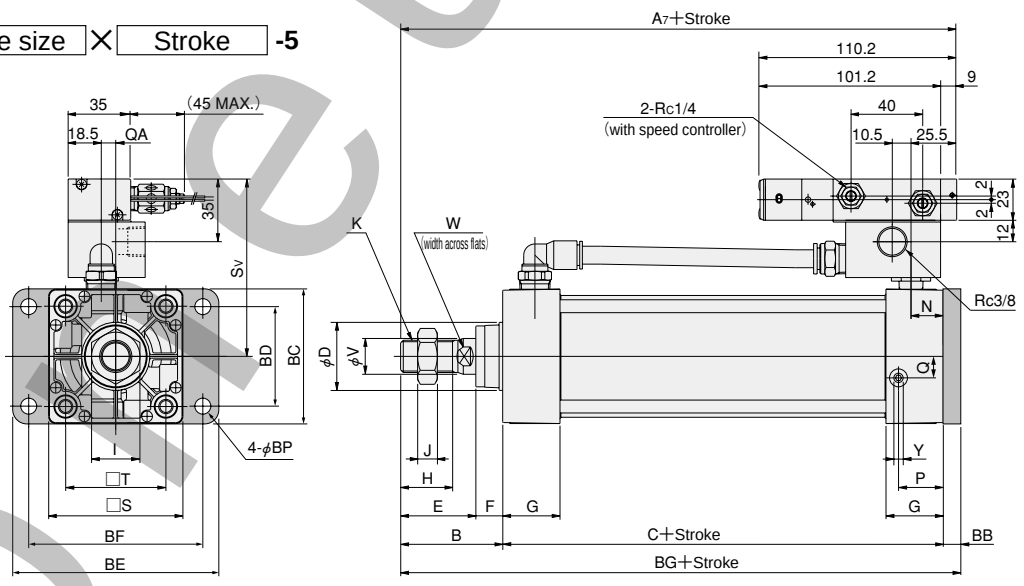


Bore size \ Code	A	A7	B	C	D	G	H	I	J	K	N	P	Q	QA	R	SV	T	V	W	Y
40	144	149.5	49	93	32	31	21	22	8	M14×1.5	18	25.5	10	4	2	(86.5)	37	16	14	2.5
50	152	157.5	57	93	38	31	29	27	11	M18×1.5	18	24	12	7	2	(92.5)	47	20	17	3
63	155	160.5	57	96	38	32	29	27	11	M18×1.5	18	25	12	8	2	(99)	56	20	17	3
80	185	188.5	75	108	44	36	37	32	13	M22×1.5	20	29	16	11	2	(108.5)	70	25	21	3
100	185	188.5	75	108	50	36	37	36	14	M26×1.5	20	29	18	12	2	(117.5)	84	30	26	3

Bore size \ Code	BA	BB	BC	BD	BE	BF	BP
40	39	10	52	36	84	70	7
50	47	10	65	47	104	86	9
63	47	10	76	56	116	98	9
80	59	16	95	70	143	119	12
100	59	16	115	84	162	138	12

Dimensions of Head Side Flange Mounting Type (Unit mm)

DDV Bore size × Stroke **-5**



Bore size \ Code	A7	B	C	D	E	F	G	H	I	J	K	N	P	Q	QA	S	SV	T	V	W	Y
40	149.5	49	93	32	34	15	31	21	22	8	M14×1.5	18	25.5	10	4	50	(86.5)	37	16	14	2.5
50	157.5	57	93	38	42	15	31	29	27	11	M18×1.5	18	24	12	7	62	(92.5)	47	20	17	3
63	160.5	57	96	38	42	15	32	29	27	11	M18×1.5	18	25	12	8	75	(99)	56	20	17	3
80	188.5	75	108	44	54	21	36	37	32	13	M22×1.5	20	29	16	11	94	(108.5)	70	25	21	3
100	188.5	75	108	50	54	21	36	37	36	14	M26×1.5	20	29	18	12	112	(117.5)	84	30	26	3

Bore size \ Code	BB	BC	BD	BE	BF	BG	BP
40	10	52	36	84	70	152	7
50	10	65	47	104	86	160	9
63	10	76	56	116	98	163	9
80	16	95	70	143	119	199	12
100	16	115	84	162	138	199	12

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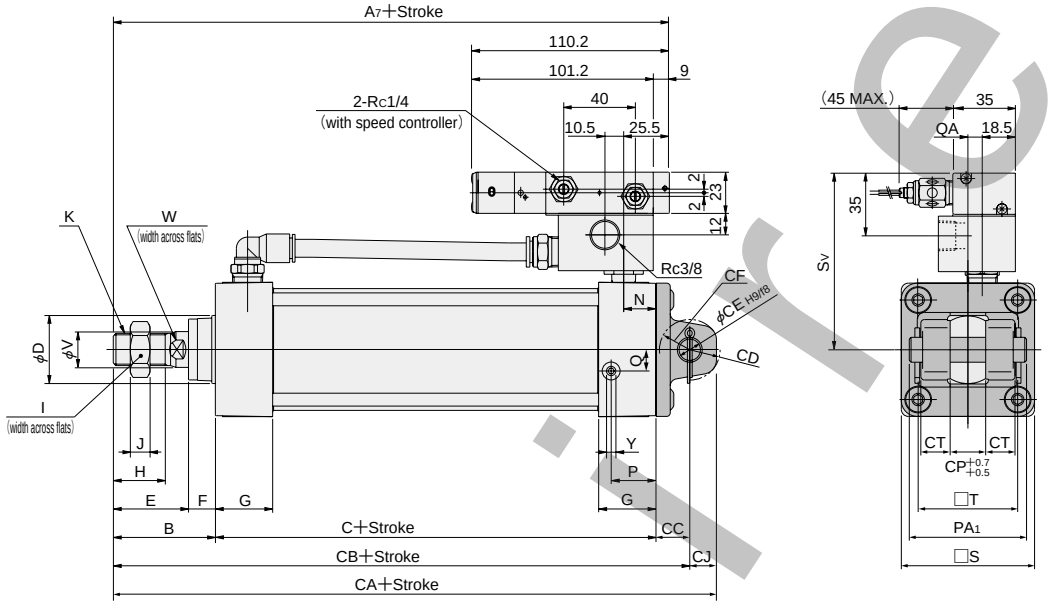
Dimensions of Clevis Mounting Type (Unit mm)

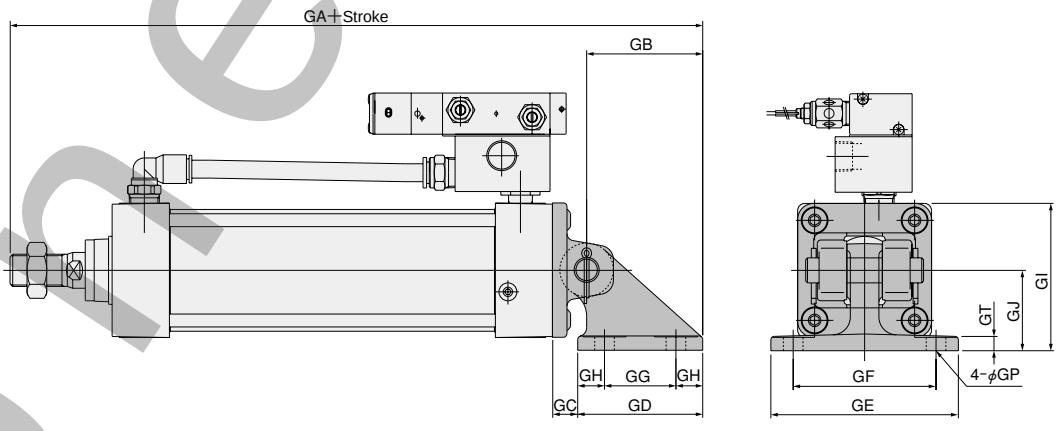
DDV Bore size × Stroke **-7**



Bore size \ Code	A7	B	C	D	E	F	G	H	I	J	K	N	P	Q	QA	S	Sv	T	V	W	Y
40	149.5	49	93	32	34	15	31	21	22	8	M14×1.5	18	25.5	10	4	50	(86.5)	37	16	14	2.5
50	157.5	57	93	38	42	15	31	29	27	11	M18×1.5	18	24	12	7	62	(92.5)	47	20	17	3
63	160.5	57	96	38	42	15	32	29	27	11	M18×1.5	18	25	12	8	75	(99)	56	20	17	3
80	188.5	75	108	44	54	21	36	37	32	13	M22×1.5	20	29	16	11	94	(108.5)	70	25	21	3
100	188.5	75	108	50	54	21	36	37	36	14	M26×1.5	20	29	18	12	112	(117.5)	84	30	26	3

Bore size \ Code	CA	CB	CC	CD	CE	CF	CJ	CP	CT	PA1
40	174	161	19	R15	14	R17	13	20	12.5	58
50	184	169	19	R17	14	R17	15	20	16.5	66
63	187	172	19	R17	14	R17	15	20	16.5	66
80	236	215	32	R24	20	R30	21	32	17.5	78
100	236	215	32	R24	20	R30	21	32	17.5	78

●With Supporting Bracket DDV Bore size × Stroke **-7-7C**



Bore size \ Code	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GP	GT
40	227.5	66.5	12.5	73	105	80	40	16.5	70	45	11(Thru hole)	8
50	235.5	66.5	12.5	73	105	80	40	16.5	76	45	11(Thru hole)	8
63	238.5	66.5	12.5	73	105	80	40	16.5	82.5	45	11(Thru hole)	8
80	301.5	86.5	20.5	98	135	105	65	16.5	107	60	14(Thru hole)	12
100	301.5	86.5	20.5	98	135	105	65	16.5	116	60	14(Thru hole)	12

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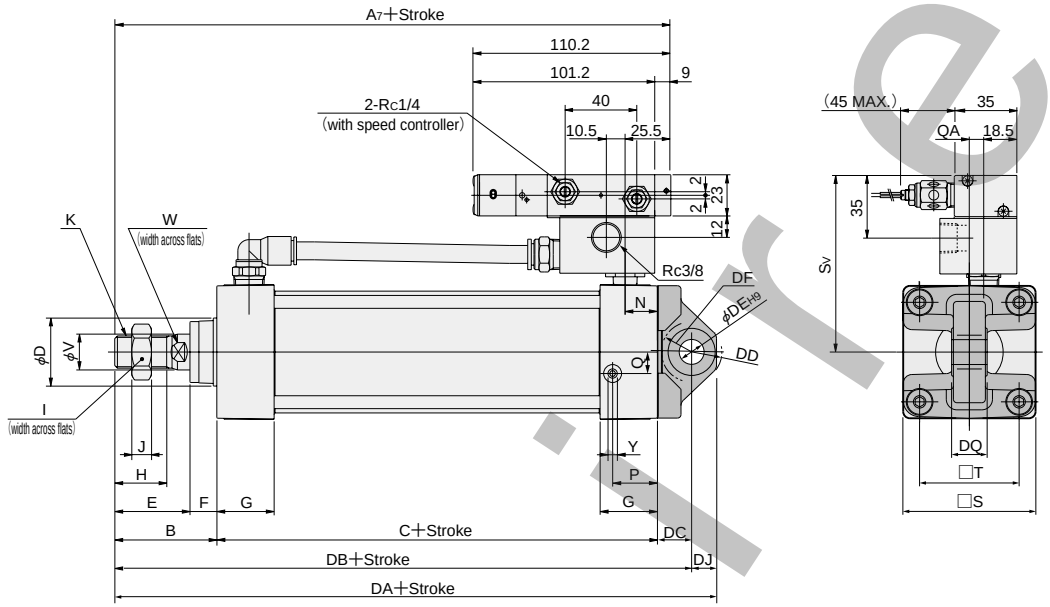
Dimensions of Pivot Mounting Type (Unit mm)

DDV Bore size × Stroke **-8**



Code / Bore size	A7	B	C	D	E	F	G	H	I	J	K	N	P	Q	QA	S	SV	T	V	W	Y
40	149.5	49	93	32	34	15	31	21	22	8	M14×1.5	18	25.5	10	4	50	(86.5)	37	16	14	2.5
50	157.5	57	93	38	42	15	31	29	27	11	M18×1.5	18	24	12	7	62	(92.5)	47	20	17	3
63	160.5	57	96	38	42	15	32	29	27	11	M18×1.5	18	25	12	8	75	(99)	56	20	17	3
80	188.5	75	108	44	54	21	36	37	32	13	M22×1.5	20	29	16	11	94	(108.5)	70	25	21	3
100	188.5	75	108	50	54	21	36	37	36	14	M26×1.5	20	29	18	12	112	(117.5)	84	30	26	3

Code / Bore size	DA	DB	DC	DD	DE	DF	DJ	DQ
40	175	161	19	R17	14	R17	14	$20\ ^{0}_{-0.084}$
50	183	169	19	R17	14	R17	14	$20\ ^{0}_{-0.084}$
63	186	172	19	R17	14	R17	14	$20\ ^{0}_{-0.084}$
80	236	215	32	R24	20	R25	21	$32\ ^{0}_{-0.100}$
100	235	215	32	R24	20	R26	20	$32\ ^{0}_{-0.100}$

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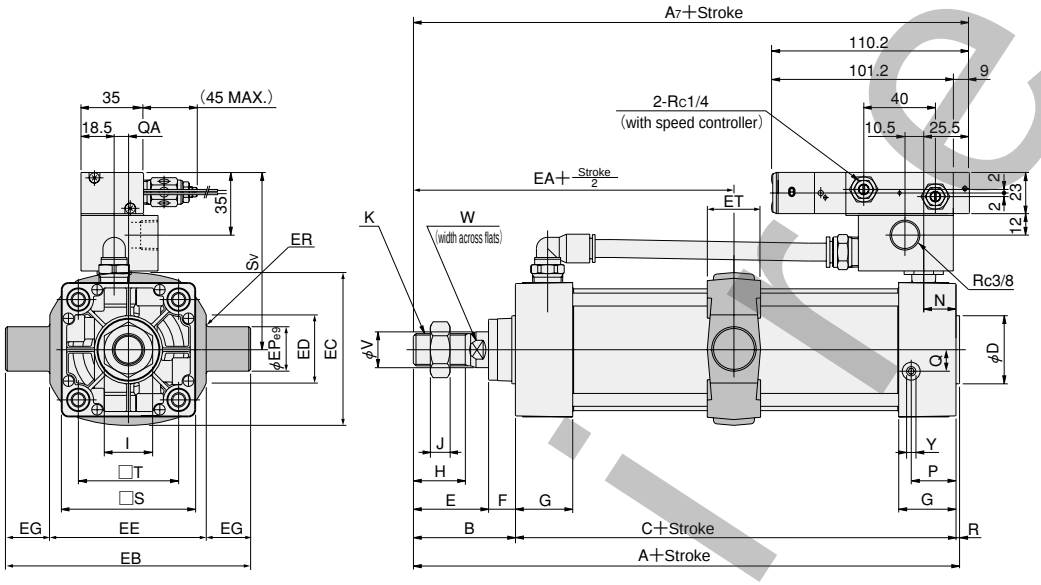
Dimensions of Trunnion Type (Unit mm)

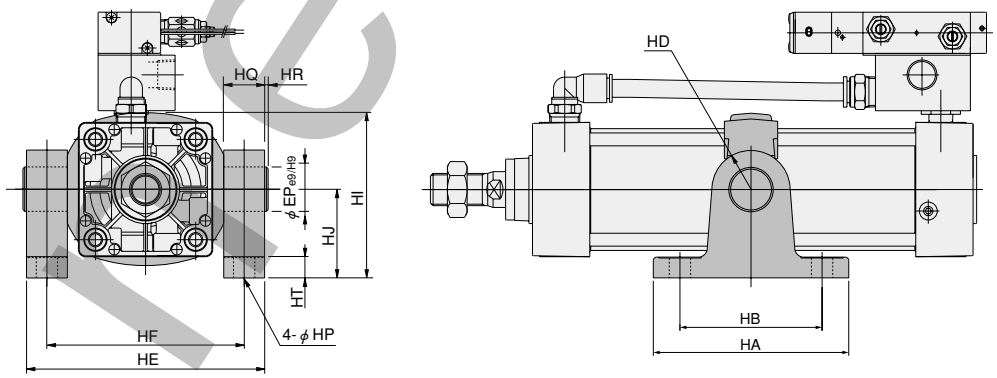
DDV Bore size × Stroke **-11**



Bore size \ Code	A	A7	B	C	D	E	F	G	H	I	J	K	N	P	Q	QA	R	S	Sv	T	V	W	Y
40	144	149.5	49	93	32	34	15	31	21	22	8	M14×1.5	18	25.5	10	4	2	50	(86.5)	37	16	14	2.5
50	152	157.5	57	93	38	42	15	31	29	27	11	M18×1.5	18	24	12	7	2	62	(92.5)	47	20	17	3
63	155	160.5	57	96	38	42	15	32	29	27	11	M18×1.5	18	25	12	8	2	75	(99)	56	20	17	3
80	185	188.5	75	108	44	54	21	36	37	32	13	M22×1.5	20	29	16	11	2	94	(108.5)	70	25	21	3
100	185	188.5	75	108	50	54	21	36	37	36	14	M26×1.5	20	29	18	12	2	112	(117.5)	84	30	26	3

Bore size \ Code	EA	EB	EC	ED	EE	EG	EP	ER	ET
40	95.5	113	60	30	63	25	25	R1.6	30
50	103.5	126	72	30	76	25	25	R1.6	30
63	105	138	87	40	88	25	25	R1.6	30
80	129	164	105	40	114	25	25	R1.6	35
100	129	182	129	44	132	25	25	R2	40

●With Supporting Bracket DDV Bore size × Stroke **-11-11T**



Bore size \ Code	HA	HB	HD	HE	HF	HI	HJ	HP	HQ	HR	HT	EP
40	111	80	R22	109	86	80	50	12(Thru hole)	23	2	14	25
50	111	80	R22	122	99	86	50	12(Thru hole)	23	2	14	25
63	111	80	R22	134	111	93.5	50	12(Thru hole)	23	2	14	25
80	121	85	R22	160	137	122.5	70	12(Thru hole)	23	2	14	25
100	121	85	R22	178	155	134.5	70	12(Thru hole)	23	2	14	25

Preview

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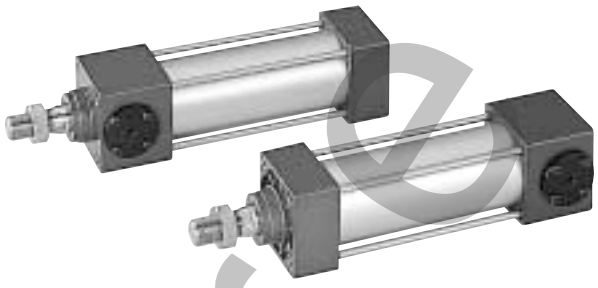
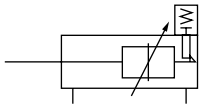
NEW DYNA End Keep Cylinders

Head Side End Keep, Rod Side End Keep

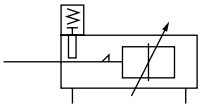


Symbol

●Head side end keep



●Rod side end keep



Specifications

Item \ Bore size mm	40	50	63	80	100
Operating method	Double acting type, with head side or rod side end keep mechanism				
Media	Air				
Mounting type	Basic type, Foot mounting type, Axis right angled foot mounting type, Rod side flange mounting type, Head side flange mounting type, Clevis mounting type, Pivot mounting type, Trunnion type				
Operating pressure range MPa {kgf/cm²}	0.15～1.0 {1.5～10.2}				
Proof pressure MPa {kgf/cm²}	1.5 {15.3}				
Operating temperature range °C	—10～70 (Freezing not allowed, with sensor, is 0～60.)				
Operating speed range mm/s	30～700				
Cushion	Variable cushion at both ends of stroke				
Cushion stroke mm	16	20		25	
Lubrication	Not required (But if you must use lubrication, use Turbine oil Class 1〔ISO VG32〕or equivalent)				
Maximum holding force (at end keep) N	880	1374	2182	3519	5498
Backlash (at end keep) mm	1.0 MAX			1.0 MAX	
Port size Rc	1/4	3/8		1/2	

Bore Size and Stroke

mm

Bore sizer	Standard stroke	Maximum potential manufacturing stroke
40	50, 75, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800	1000
50	50, 75, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800, 900, 1000	1500
63		
80		
100		

Remarks : 1. Stroke tolerance: Strokes of 250 or less are $^{+1}_{0}$, strokes of 251～1000 are $^{+1.5}_{0}$, and strokes of 1001 or more are $^{+2.0}_{0}$.
2. For non-standard strokes, consult us.
3. Cylinders with magnet are not available in steel tube specification.
4. For the maximum potential manufacturing stroke with bellows specification, see p. 104.

Order Code

DDA □ 50×100 — □ — □ — □ — □ — □ — □ — □ — □ □ □

NEW DYNA Cylinders
Basic model

Bore size × Stroke

Non-ion specification
Blank — Standard
NCU — Non-ion specification

Cylinder specification
K — End keep cylinder
JK — End keep cylinder with bellows

Types of bellows
JT — Nylon tarpaulin (～80˚C)
JC — Chloroprene (～100˚C)
JK — Cornex (～200˚C)
JA — Arumix (～250˚C)
●Cornex is a registered trademark of Teijin, Inc.
●The temperature shown is the bellows own durable temperature, and is not a temperature for cylinder use.

End keep position
HL — Head side end keep
RL — Rod side end keep

Tube material
Blank — Standard (Aluminum tube)
FT — Steel tube specification (Not available for cylinder with magnet.)

Mounting type
Blank — Basic type
1 — Foot mounting type
2 — Axis right angled foot mounting type
3 — Rod side flange mounting type
5 — Head side flange mounting type
7 — Clevis mounting type (with pin)
7-7C — Clevis mounting type (with supporting brackets)
8 — Pivot mounting type
11 — Trunnion type
11-11T — Trunnion type (with supporting bracket)
●Mounting brackets are included at time of delivery, with the exception of the trunnion type.
●Orders for mounting brackets only are also accepted.

Sensor switch

ZC130	2-lead wires	Solid state type	with indicator lamp	DC10～28V
ZC153	3-lead wires	Solid state type	with indicator lamp	DC4.5～28V
CS5T	2-lead wires	Reed switch type	without indicator lamp	DC5～28V, AC85～115V
CS11T	2-lead wires	Reed switch type	with indicator lamp	DC10～28V
CS2F	DIN type	Reed switch type	with indicator lamp	AC85～230V
CS3F	DIN type	Reed switch type	with indicator lamp	DC10～30V
CS4F	DIN type	Reed switch type	with indicator lamp	DC10～30V
CS5F	DIN type	Reed switch type	without indicator lamp	DC3～30V

●For sensor switch specifications, see p. 97, while for mountings, see p. 101.
●Cylinders with magnet are not available in steel tube specification.
●**CS□F** comes with a DIN connector. All others are grommet type.
●Orders for sensor switches only are also accepted.

Rod end mounting
Blank — Without rod end mounting
Y — With Y type knuckle (with pin)
I — With I type knuckle
●Place separate orders for the cylinder joint and cylinder rod end.
●Orders for rod end mounting only are also accepted.
●For rod end mounting dimensions, see p. 105.

Number of sensor switches
1 — With one sensor switch
2 — With two sensor switches
⋮ ⋮
n — With n sensor switches

Lead wire length (Applicable to **ZC,CS□T type**)
A : 1000mm
B : 3000mm

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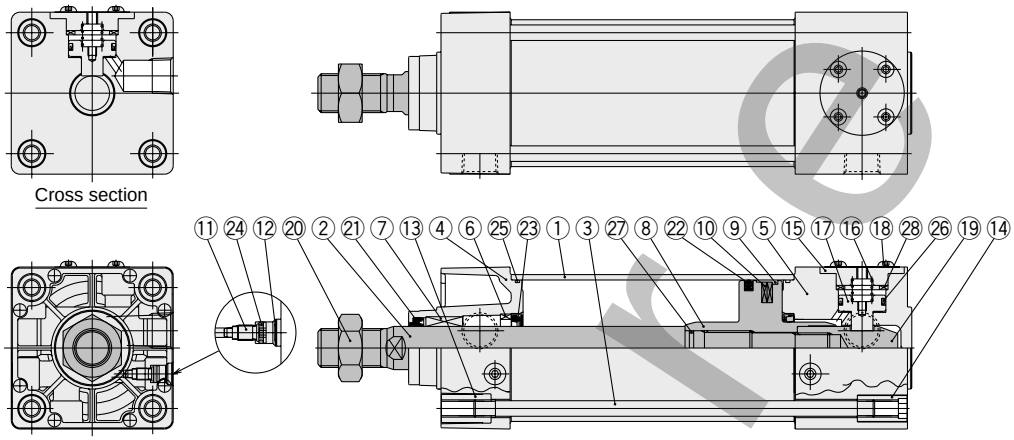
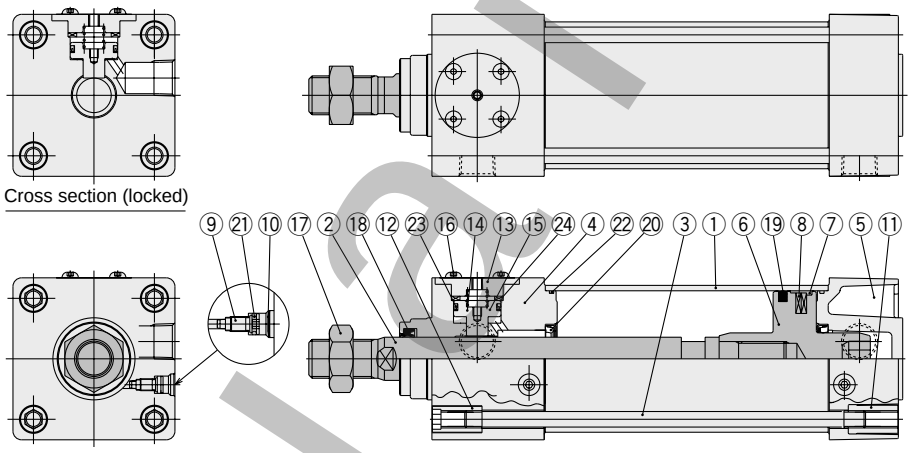
Inner Construction and Major Parts

●Head side end keep



●Rod side end keep



Major Parts and Materials

●Head side end keep

No.	Parts	Materials
①	Cylinder tube	Aluminum alloy
②	Piston rod	Carbon steel for machine structural use
③	Tie rod	Carbon steel for machine structural use
④	Rod cover	Aluminum die-cast
⑤	Head cover	Aluminum alloy
⑥	Keep ring	Aluminum alloy
⑦	Rod bushing	Oil-permeated sintered copper alloy
⑧	Piston	Aluminum alloy
⑨	Wear ring	Plastic
⑩	Magnet	Rubber magnet
⑪	Cushion needle	Carbon steel for machine structural use
⑫	Snap ring	Spring steel
⑬	Tie rod nut R	Rolled steel for general structural use
⑭	Tie rod nut H	Chrome-molybdenum steel
⑮	Lock cover	Aluminum alloy
⑯	Spring	Spring steel
⑰	Lock piston	Aluminum alloy
⑱	Button bolt	Chrome-molybdenum steel
⑲	Lock sleeve	Carbon steel for machine structural use
⑳	Rod end nut	Rolled steel for general structural use
㉑	Rod seal	Synthetic rubber (NBR)
㉒	Piston seal	Synthetic rubber (NBR)
㉓	Cushion seal	Synthetic rubber (NBR)
㉔	Cushion gasket	Synthetic rubber (NBR)
㉕	Tube gasket	Synthetic rubber (NBR)
㉖	Lock piston seal	Synthetic rubber (NBR)
㉗	Piston gasket	Synthetic rubber (NBR)
㉘	Bumper	Urethane rubber

●Rod side end keep

No.	Parts	Materials
①	Cylinder tube	Aluminum alloy
②	Piston rod	Carbon steel for machine structural use
③	Tie rod	Carbon steel for machine structural use
④	Rod cover	Aluminum alloy
⑤	Head cover	Aluminum die-cast
⑥	Piston	Aluminum alloy
⑦	Wear ring	Plastic
⑧	Magnet	Rubber magnet
⑨	Cushion needle	Carbon steel for machine structural use
⑩	Snap ring	Spring steel
⑪	Tie rod nut R	Rolled steel for general structural use
⑫	Tie rod nut H	Chrome-molybdenum steel
⑬	Lock cover	Aluminum alloy
⑭	Spring	Spring steel
⑮	Lock piston	Aluminum alloy
⑯	Button bolt	Chrome-molybdenum steel
⑰	Rod end nut	Rolled steel for general structural use
⑱	Rod seal	Synthetic rubber (NBR)
⑲	Piston seal	Synthetic rubber (NBR)
⑳	Cushion seal	Synthetic rubber (NBR)
㉑	Cushion gasket	Synthetic rubber (NBR)
㉒	Tube gasket	Synthetic rubber (NBR)
㉓	Lock piston seal	Synthetic rubber (NBR)
㉔	Bumper	Urethane rubber

Preview

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Seals

Parts / Bore size mm \ Quantity	Rod seal	Piston seal	Cushion seal	Tube gasket	Cushion gasket	Lock piston seal	Piston gasket
	1	1	2	2	2	1	1[Note]
40	DRP16	PWP40N	CPF20	1.5×40	S5	MYA18	S10
50	DRP20	PWP50N	CPF24	1.5×50	S6	MYA18	S14
63	DRP20	PWP63N	CPF24	1.5×63	S6	MYA18	S14
80	DRP25	PWP80N	CPF30	1.5×80	S6	MYA24	S18
100	DRP30	PWP100N	CPF35	1.5×100	S6	MYA24	S18

Note: Head side end keep only.

Mass

●Head side end keep

kg

Bore size mm	Mass at zero stroke									Additional mass for each 1mm stroke	Mass of one sensor switch [with holder]		Mass of knuckle	
	Basic type	Foot mounting type	Axis right angled foot mounting type	Flange mounting type	Clevis mounting type (with pin)	Clevis mounting type (with supporting bracket)	Pivot mounting type	Trunnion type	Trunnion type (with supporting bracket)		ZC□□□ CS□T Note	CS□F	Y type knuckle (with pin)	I type knuckle
40	0.98 (1.02)	1.11 (1.15)	1.18 (1.22)	1.35 (1.39)	1.25 (1.29)	1.95 (1.99)	1.16 (1.20)	1.46 (1.50)	1.96 (2.00)	0.00300 (0.00431)	0.04	0.05	0.27	0.16
50	1.55 (1.61)	1.72 (1.78)	1.87 (1.93)	1.94 (2.00)	1.94 (2.00)	2.64 (2.70)	1.81 (1.87)	2.10 (2.16)	2.60 (2.66)	0.00428 (0.00635)			0.34	0.21
63	2.06 (2.37)	2.29 (2.37)	2.58 (2.66)	2.59 (2.67)	2.54 (2.62)	3.24 (3.32)	2.48 (2.56)	2.76 (2.84)	3.26 (3.34)	0.00515 (0.00773)	0.04	0.06	0.34	0.21
80	3.69 (3.86)	4.07 (4.24)	4.54 (4.71)	5.29 (5.46)	4.61 (4.78)	5.33 (5.50)	4.77 (4.94)	4.85 (5.02)	5.57 (5.74)	0.00834 (0.01302)			0.87	0.62
100	4.83 (5.04)	5.30 (5.51)	6.11 (6.32)	7.05 (7.26)	6.07 (6.28)	6.79 (7.00)	6.22 (6.43)	6.36 (6.57)	7.08 (7.29)	0.01061 (0.01642)			1.47	1.24

Note: For lead wire length A (1000mm).
Remark: Figures in parentheses ( ) are for steel tube specifications.

Calculation example: For a foot mounting type with bore size of 50mm, and a 100mm stroke
1.72+(0.00428×100)=2.148kg

●Rod side end keep

kg

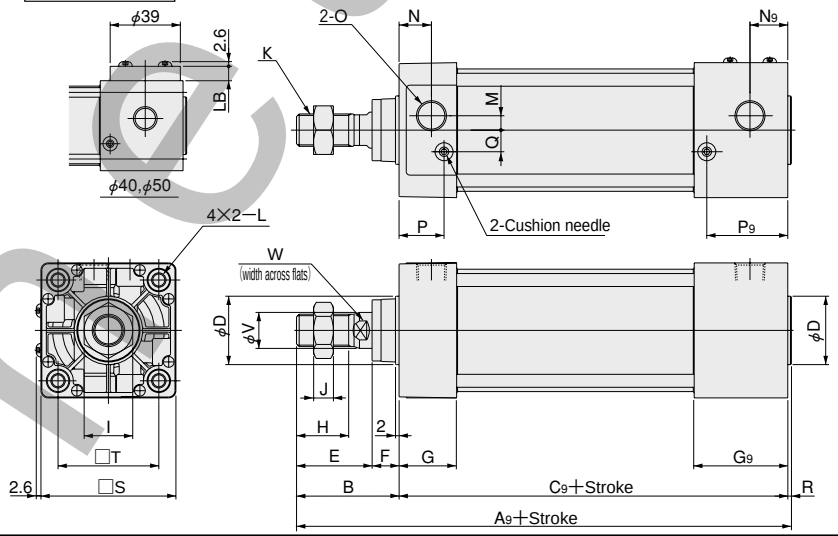
Bore size mm	Mass at zero stroke									Additional mass for each 1mm stroke	Mass of one sensor switch [with holder]		Mass of knuckle	
	Basic type	Foot mounting type	Axis right angled foot mounting type	Flange mounting type	Clevis mounting type (with pin)	Clevis mounting type (with supporting bracket)	Pivot mounting type	Trunnion type	Trunnion type (with supporting bracket)		ZC□□□ CS□T Note	CS□F	Y type knuckle (with pin)	I type knuckle
40	0.94 (0.98)	1.07 (1.11)	1.14 (1.18)	1.31 (1.35)	1.21 (1.25)	1.91 (1.95)	1.12 (1.16)	1.42 (1.46)	1.92 (1.96)	0.00300 (0.00431)	0.04	0.05	0.27	0.16
50	1.49 (1.55)	1.66 (1.72)	1.81 (1.87)	1.88 (1.94)	1.88 (1.94)	2.58 (2.64)	1.75 (1.81)	2.04 (2.10)	2.54 (2.60)	0.00428 (0.00635)			0.34	0.21
63	2.00 (2.08)	2.23 (2.31)	2.52 (2.60)	2.53 (2.61)	2.48 (2.56)	3.18 (3.26)	2.42 (2.50)	2.70 (2.78)	3.20 (3.28)	0.00515 (0.00773)	0.04	0.06	0.34	0.21
80	3.58 (3.75)	3.96 (4.13)	4.43 (4.60)	5.18 (5.35)	4.50 (4.67)	5.22 (5.39)	4.66 (4.83)	4.74 (4.91)	5.46 (5.63)	0.00834 (0.01302)			0.87	0.62
100	4.67 (4.88)	5.14 (5.35)	5.95 (6.16)	6.89 (7.10)	5.91 (6.12)	6.63 (6.84)	6.06 (6.27)	6.20 (6.41)	6.92 (7.13)	0.01061 (0.01642)			1.47	1.24

Note: For lead wire length A (1000mm).
Remark: Figures in parentheses ( ) are for steel tube specifications.

Calculation example: For a foot mounting type with bore size of 50mm, and a 100mm stroke
1.66+(0.00428×100)=2.088kg

Dimensions of Head Side End Keep, Basic Type (Unit mm)

DDAK Bore size × Stroke **-HL**



Bore size \ Code	A9	B	C9	D	E	F	G	G9	H	I	J	K
40	159	49	108	32	34	15	31	46	21	22	8	M14×1.5
50	172	57	113	38	42	15	31	51	29	27	11	M18×1.5
63	175	57	116	38	42	15	32	52	29	27	11	M18×1.5
80	210	75	133	44	54	21	36	61	37	32	13	M22×1.5
100	210	75	133	50	54	21	36	61	37	36	14	M26×1.5

Bore size \ Code	L	M	N	N9	O	P	P9	Q	R	S	T	V	W	LB
40	M6×1 Depth 14	4	18	21	Rc1/4	25.5	40.5	10	2	50	37	16	14	8
50	M6×1 Depth 14	7	18	21	Rc3/8	24	44	12	2	62	47	20	17	4
63	M8×1.25 Depth 14	8	18	21	Rc3/8	25	45	12	2	75	56	20	17	—
80	M10×1.5 Depth 15	11	20	24	Rc1/2	29	54	16	2	94	70	25	21	—
100	M10×1.5 Depth 15	12	20	24	Rc1/2	29	54	18	2	112	84	30	26	—

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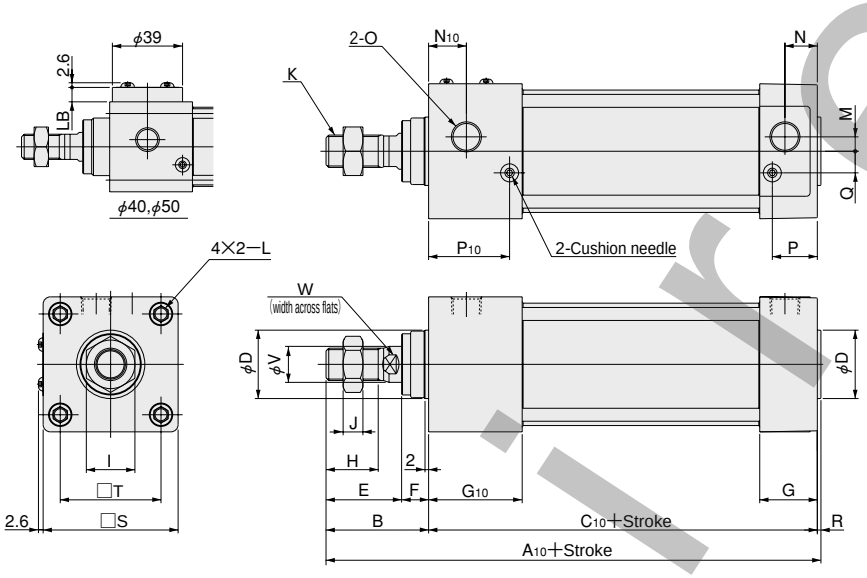
Dimensions of Rod Side End Keep, Basic Type (Unit mm)

DDAK Bore size × Stroke **-RL**



Bore size \ Code	A10	B	C10	D	E	F	G	G10	H	I	J	K
40	159	49	108	32	34	15	31	46	21	22	8	M14×1.5
50	172	57	113	38	42	15	31	51	29	27	11	M18×1.5
63	175	57	116	38	42	15	32	52	29	27	11	M18×1.5
80	210	75	133	44	54	21	36	61	37	32	13	M22×1.5
100	210	75	133	50	54	21	36	61	37	36	14	M26×1.5

Bore size \ Code	L	M	N	N10	O	P	P10	Q	R	S	T	V	W	LB
40	M6×1 Depth 14	4	18	21	Rc1/4	25.5	40.5	10	2	50	37	16	14	8
50	M6×1 Depth 14	7	18	21	Rc3/8	24	44	12	2	62	47	20	17	4
63	M8×1.25 Depth 14	8	18	21	Rc3/8	25	45	12	2	75	56	20	17	—
80	M10×1.5 Depth 15	11	20	24	Rc1/2	29	54	16	2	94	70	25	21	—
100	M10×1.5 Depth 15	12	20	24	Rc1/2	29	54	18	2	112	84	30	26	—

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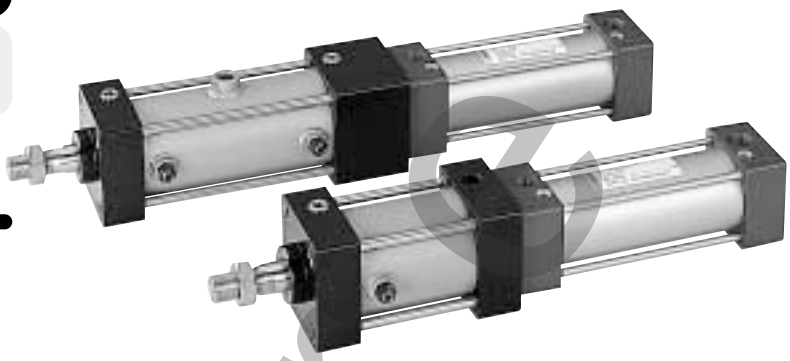
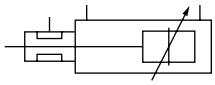
NEW DYNA Cylinders with Brake

Single brake, Double brake



Symbol



Specifications

Item \ Bore size mm		40	50	63	80	100
Operating method		Double acting type				
Media		Air				
Mounting type		Basic type, Foot mounting type, Axis right angled foot mounting type, Rod side flange mounting type, Head side flange mounting type, Clevis mounting type, Pivot mounting type				
Operating pressure range	MPa{kgf/cm²}	0.1～1.0 {1.0～10.2}				
Proof pressure	MPa{kgf/cm²}	1.5 {15.3}				
Operating temperature range	°C	5～60				
Operating speed range	mm/s	50～300				
Cushion		Variable cushion at both ends of stroke				
Cushion stroke	mm	16	20		25	
Lubrication		Required (Turbine oil Class 1 ISO VG32 equivalent)				
Brake release pressure	MPa{kgf/cm²}	0.35{3.6}	0.4{4.1}	0.35{3.6}		
Brake acting direction		Two-way				
Stopping repeatability	mm	±2				
Maximum payload N{kgf}	Single brake	333 {34}	519 {53}	833 {85}	1352 {138}	2107 {215}
	Double brake	666 {68}	1038 {106}	1666 {170}	2705 {276}	4214 {430}
Port size	Rc	1/4	3/8		1/2	
Brake unit connection port	Rc	1/4			3/8	

Bore size and Stroke

mm

Bore sizer	Standard stroke	Maximum potential manufacturing stroke
40	50, 75, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800	1000
50	50, 75, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800, 900, 1000	1500
63		
80		
100		

Remarks: 1. Stroke tolerance: Strokes of 250 or less are $^{+1}_{0}$, strokes of 251～1000 are $^{+1.5}_{0}$, and strokes of 1001 or more are $^{+2.0}_{0}$.
2. For non-standard strokes, consult us.
3. Cylinders with magnet are not available for heat resitance specification and steel tube specification.
4. For the maximum potential manufacturing stroke with bellows specification, see p. 104.

Order Code

DDA □ **50×100** – □ – □ – □ – □ – □ – □ □ □

NEW DYNA Cylinders Basic model

Bore size × Stroke

Types of bellows
JT — Nylon tarpaulin (～80˚C)
JC — Chloroprene (～100˚C)
JK — Cornex (～200˚C)
JA — Arumix (～250˚C)
●Cornex is a registered trademark of Teijin, Inc.
●The temperature shown is the bellows own durable temperature, and is not a temperature for cylinder use.

Cylinder specification
R — Single brake cylinder
RR — Double brake cylinder
JR — Single brake cylinder with bellows
JRR — Double brake cylinder with bellows

Tube material
Blank — Standard (Aluminum tube)
FT — Steel tube specification
(Not available for cylinder with magnet.)

Mounting type
Blank — Basic type
1 — Foot mounting type
2 — Axis right angled foot mounting type
3 — Rod side flange mounting type
5 — Head side flange mounting type
7 — Clevis mounting type (with pin)
7-7C — Clevis mounting type (with supporting bracket)
8 — Pivot mounting type

Rod end mounting
Blank — Without rod end mounting
Y — With Y type knuckle (with pin)
I — With I type knuckle
●Place separate orders for the cylinder joint and cylinder rod end.
●Orders for rod end mounting only are also accepted.
●For rod end mounting dimensions, see p. 105.

Sensor switch (for cylinder with magnet)

ZC130	2-lead wires	Solid state type	with indicator lamp	DC10～28V
ZC153	3-lead wires	Solid state type	with indicator lamp	DC4.5～28V
CS5T	2-lead wires	Reed switch type	without indicator lamp	DC5～28V, AC85～115V
CS11T	2-lead wires	Reed switch type	with indicator lamp	DC10～28V
CS2F	DIN type	Reed switch type	with indicator lamp	AC85～230V
CS3F	DIN type	Reed switch type	with indicator lamp	DC10～30V
CS4F	DIN type	Reed switch type	with indicator lamp	DC10～30V
CS5F	DIN type	Reed switch type	without indicator lamp	DC3～30V

●For sensor switch specifications, see p. 97, while for mountings, see p. 101.
●**CS□F** comes with a DIN connector. All others are grommet type.
●Orders for sensor switches only are also accepted.

Lead wire length
(Applicable to **ZC,CS□T type**)
A : 1000mm
B : 3000mm

Number of sensor switches
1 — With one sensor switch
2 — With two sensor switches
⋮ ⋮
n — With n sensor switches

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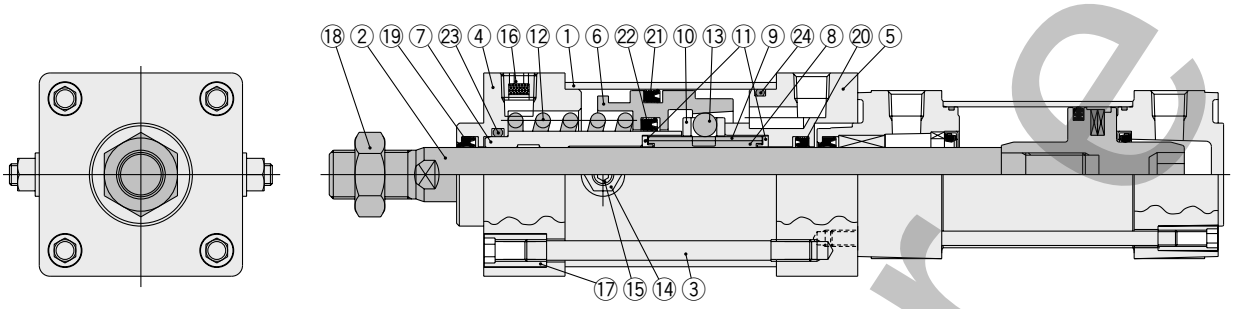
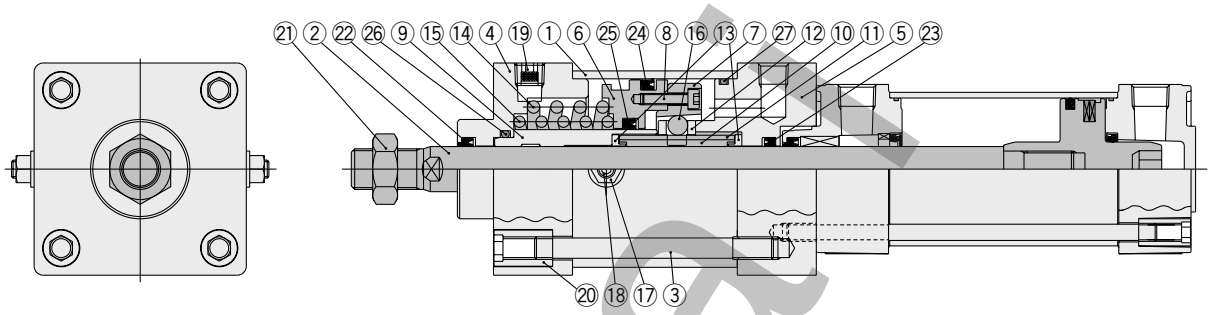
Inner Construction and Major Parts

●Single brake φ40, φ50



●Single brake φ63～φ100



Major Parts and Materials

Note: For the cylinder body, see the NEW DYNA Standard Cylinder.

●Single brake φ40, φ50

No.	Parts	Materials
①	Brake tube	Carbon steel for machine structural use
②	Piston rod	Carbon steel for machine structural use
③	Brake tie rod	Carbon steel for machine structural use
④	Front cover	Aluminum alloy
⑤	Rear cover	Aluminum alloy
⑥	Brake piston	Cast iron
⑦	Spacer S	Plastic
⑧	Brake shoe	Phosphor bronze
⑨	Ring	High carbon chrome bearing steel
⑩	Retainer A	High carbon chrome bearing steel
⑪	Retainer B	Carbon steel for machine structural use
⑫	Spring	Piano wire
⑬	Steel ball	High carbon chrome bearing steel
⑭	Lock nut	Rolled steel for general structural use
⑮	Brake lock release screw	Chrome-molybdenum steel
⑯	Filter	Chrome-molybdenum steel＋plastic
⑰	Tie rod nut H	Chrome-molybdenum steel
⑱	Rod end nut	Rolled steel for general structural use
⑲	Brake rod seal A	Synthetic rubber (NBR)
⑳	Brake rod seal B	Synthetic rubber (NBR)
㉑	Brake piston seal A	Synthetic rubber (NBR)
㉒	Brake piston seal B	Synthetic rubber (NBR)
㉓	Spacer gasket	Synthetic rubber (NBR)
㉔	Rear cover gasket	Synthetic rubber (NBR)

●Single brake φ63～φ100

No.	Parts	Materials
①	Brake tube	Carbon steel for machine structural use
②	Piston rod	Carbon steel for machine structural use
③	Brake tie rod	Carbon steel for machine structural use
④	Front cover	Aluminum alloy
⑤	Rear cover	Aluminum alloy
⑥	Brake piston	Cast iron
⑦	Taper ring	High carbon chrome bearing steel
⑧	Hexagon socket bolt	Chrome-molybdenum steel
⑨	Spacer S	Plastic
⑩	Brake shoe	Phosphor bronze
⑪	Ring	High carbon chrome bearing steel
⑫	Retainer A	High carbon chrome bearing steel
⑬	Retainer B	Carbon steel for machine structural use
⑭	Spring A	Piano wire
⑮	Spring B	Piano wire
⑯	Steel ball	High carbon chrome bearing steel
⑰	Lock nut	Rolled steel for general structural use
⑱	Brake lock release screw	Chrome-molybdenum steel
⑲	Filter	Chrome-molybdenum steel＋plastic
⑳	Tie rod nut H	Chrome-molybdenum steel
㉑	Rod end nut	Rolled steel for general structural use
㉒	Brake rod seal A	Synthetic rubber (NBR)
㉓	Brake rod seal B	Synthetic rubber (NBR)
㉔	Brake piston seal A	Synthetic rubber (NBR)
㉕	Brake piston seal B	Synthetic rubber (NBR)
㉖	Spacer gasket	Synthetic rubber (NBR)
㉗	Rear cover gasket	Synthetic rubber (NBR)

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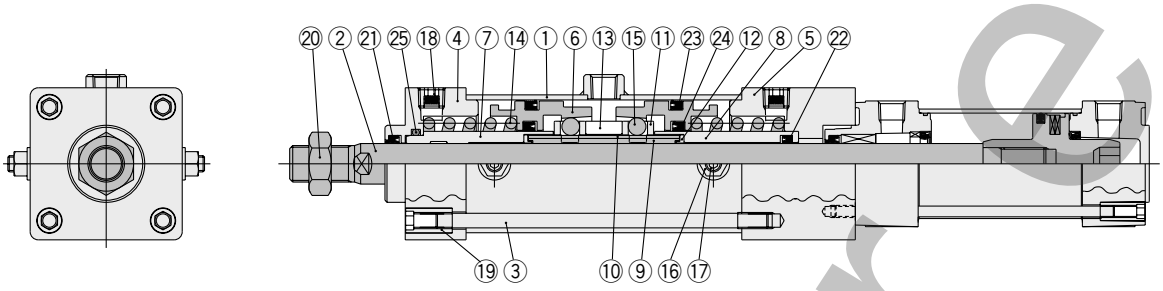
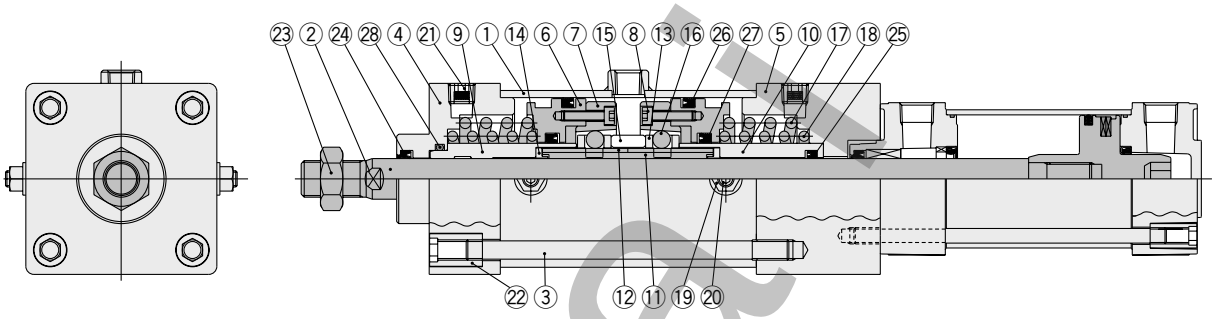
Inner Construction and Major Parts

●Double brake ϕ40, ϕ50



●Double brake ϕ63～ϕ100



Major Parts and Materials

Note：For the cylinder body, see the NEW DYNA Standard Cylinder.

●Double brake ϕ40, ϕ50

No.	Parts	Materials
①	Brake tube	Carbon steel for machine structural use
②	Piston rod	Carbon steel for machine structural use
③	Brake tie rod	Carbon steel for machine structural use
④	Front cover	Aluminum alloy
⑤	Rear cover	Aluminum alloy
⑥	Brake piston	Cast iron
⑦	Spacer S	Plastic
⑧	Spacer D	Plastic
⑨	Brake shoe	Phosphor bronze
⑩	Ring	High carbon chrome bearing steel
⑪	Retainer A	High carbon chrome bearing steel
⑫	Retainer B	Carbon steel for machine structural use
⑬	Retainer D	Carbon steel for machine structural use
⑭	Spring	Piano wire
⑮	Steel ball	High carbon chrome bearing steel
⑯	Lock nut	Rolled steel for general structural use
⑰	Brake lock release screw	Chrome-molybdenum steel
⑱	Filter	Chrome-molybdenum steel＋plastic
⑲	Tie rod nut H	Chrome-molybdenum steel
⑳	Rod end nut	Rolled steel for general structural use
㉑	Brake rod seal A	Synthetic rubber (NBR)
㉒	Brake rod seal B	Synthetic rubber (NBR)
㉓	Brake piston seal A	Synthetic rubber (NBR)
㉔	Brake piston seal B	Synthetic rubber (NBR)
㉕	Spacer gasket	Synthetic rubber (NBR)

●Double brake ϕ63～ϕ100

No.	Parts	Materials
①	Brake tube	Carbon steel for machine structural use
②	Piston rod	Carbon steel for machine structural use
③	Brake tie rod	Carbon steel for machine structural use
④	Front cover	Aluminum alloy
⑤	Rear cover	Aluminum alloy
⑥	Brake piston	Cast iron
⑦	Taper ring	High carbon chrome bearing steel
⑧	Hexagon socket bolt	Chrome-molybdenum steel
⑨	Spacer S	Plastic
⑩	Spacer D	Plastic
⑪	Brake shoe	Phosphor bronze
⑫	Ring	High carbon chrome bearing steel
⑬	Retainer A	High carbon chrome bearing steel
⑭	Retainer B	Carbon steel for machine structural use
⑮	Retainer D	Carbon steel for general structural use
⑯	Steel ball	High carbon chrome bearing steel
⑰	Spring A	Piano wire
⑱	Spring B	Piano wire
⑲	Lock nut	Rolled steel for general structural use
⑳	Brake lock release screw	Chrome-molybdenum steel
㉑	Filter	Chrome-molybdenum steel＋Plastic
㉒	Tie rod nut H	Chrome-molybdenum steel
㉓	Rod end nut	Rolled steel for general structural use
㉔	Brake rod seal A	Synthetic rubber (NBR)
㉕	Brake rod seal B	Synthetic rubber (NBR)
㉖	Brake piston seal A	Synthetic rubber (NBR)
㉗	Brake piston seal B	Synthetic rubber (NBR)
㉘	Spacer gasket	Synthetic rubber (NBR)

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Seals

●Single brake

Parts	Rod seal for front cover	Rod seal for rear cover	Piston seal A	Piston seal B	Spacer gasket	Rear cover gasket
Bore size mm \ Quantity	1	1	1	1	1	1
40	DRP16	PNU16	PNU40	PNU28	P22	G45
50	DRP20	PNU20	PNU53	PNU32	P28	G58
63	DRP20	PNU20	PNU70	GLY35	P28	G75
80	DRP25	PNU25A	PNU85	PNU45	P32	G95
100	DRP30	PNU30	PNU115	PNU50	P40	G120

●Double brake

Parts	Rod seal for front cover	Rod seal for rear cover	Piston seal A	Piston seal B	Spacer gasket
Bore size mm \ Quantity	1	1	2	2	1
40	DRP16	PNU16	PNU40	PNU28	P22
50	DRP20	PNU20	PNU53	PNU32	P28
63	DRP20	PNU20	PNU70	GLY35	P28
80	DRP25	PNU25A	PNU85	PNU45	P32
100	DRP30	PNU30	PNU115	PNU50	P40

Mass

Single brake

kg

Bore size mm	Mass at zero stroke								Additional mass for each 1mm stroke	Mass of one sensor switch [with holder]		Mass of knuckle	
	Basic type	Foot mounting type	Axis right angled foot mounting type	Rod side flange mounting type	Head side flange mounting type	Clevis mounting type (with pin)	Clevis mounting type (with supporting bracket)	Pivot mounting type		ZC□□□ CS□□T Note	CS□F	Y type knuckle (with pin)	I type knuckle
40	2.21 (2.25)	2.38 (2.42)	2.51 (2.55)	2.60 (2.64)	2.58 (2.62)	2.48 (2.52)	3.18 (3.22)	2.39 (2.43)	0.00300 (0.00431)	0.04	0.05	0.27	0.16
50	3.62 (3.68)	3.85 (3.91)	4.14 (4.20)	4.15 (4.21)	4.01 (4.07)	4.01 (4.07)	4.71 (4.77)	3.88 (3.94)	0.00428 (0.00635)			0.34	0.21
63	5.68 (5.76)	6.06 (6.14)	6.53 (6.61)	7.28 (7.36)	6.21 (6.29)	6.16 (6.24)	6.86 (6.94)	6.10 (6.18)	0.00515 (0.00773)	0.04	0.06	0.34	0.21
80	8.97 (9.14)	9.44 (9.61)	10.25 (10.42)	11.19 (11.36)	10.57 (10.74)	9.89 (10.06)	10.61 (10.78)	10.05 (10.22)	0.00834 (0.01302)			0.87	0.62
100	14.69 (14.90)	15.25 (15.46)	16.36 (16.57)	17.56 (17.77)	16.91 (17.12)	15.93 (16.14)	16.65 (16.86)	16.08 (16.29)	0.01061 (0.01642)			1.47	1.24

Note: For lead wire length A (1000mm).
Remark: Figures in parentheses ( ) are for steel tube specifications.

Calculation example: For a foot mounting type with bore size of 50mm, and a 100mm stroke
3.62＋(0.00428×100)＝4.048kg

Double brake

kg

Bore size mm	Mass at zero stroke								Additional mass for each 1mm stroke	Mass of one sensor switch [with holder]		Mass of knuckle	
	Basic type	Foot mounting type	Axis right angled foot mounting type	Rod side flange mounting type	Head side flange mounting type	Clevis mounting type (with pin)	Clevis mounting type (with supporting bracket)	Pivot mounting type		ZC□□□ CS□□T Note	CS□F	Y type knuckle (with pin)	I type knuckle
40	3.32 (3.36)	3.49 (3.53)	3.62 (3.66)	3.71 (3.75)	3.69 (3.73)	3.59 (3.63)	4.29 (4.33)	3.50 (3.54)	0.00300 (0.00431)	0.04	0.05	0.27	0.16
50	4.44 (4.50)	4.67 (4.73)	4.96 (5.02)	4.97 (5.03)	4.83 (4.89)	4.83 (4.89)	5.53 (5.59)	4.70 (4.76)	0.00428 (0.00635)			0.34	0.21
63	6.93 (7.01)	7.31 (7.39)	7.78 (7.86)	8.53 (8.61)	7.46 (7.54)	7.41 (7.49)	8.11 (8.19)	7.35 (7.43)	0.00515 (0.00773)	0.04	0.06	0.34	0.21
80	11.15 (11.32)	11.62 (11.79)	12.43 (12.60)	13.37 (13.54)	12.75 (12.92)	12.07 (12.24)	12.79 (12.96)	12.23 (12.40)	0.00834 (0.01302)			0.87	0.62
100	19.32 (19.53)	19.88 (20.09)	20.99 (21.20)	22.19 (22.40)	21.54 (21.75)	20.56 (20.79)	21.28 (21.49)	20.71 (20.92)	0.01061 (0.01642)			1.47	1.24

Note: For lead wire length A (1000mm).
Remark: Figures in parentheses ( ) are for steel tube specifications.

Calculation example: For a foot mounting type with bore size of 50mm, and a 100mm stroke
4.44＋(0.00428×100)＝4.868kg

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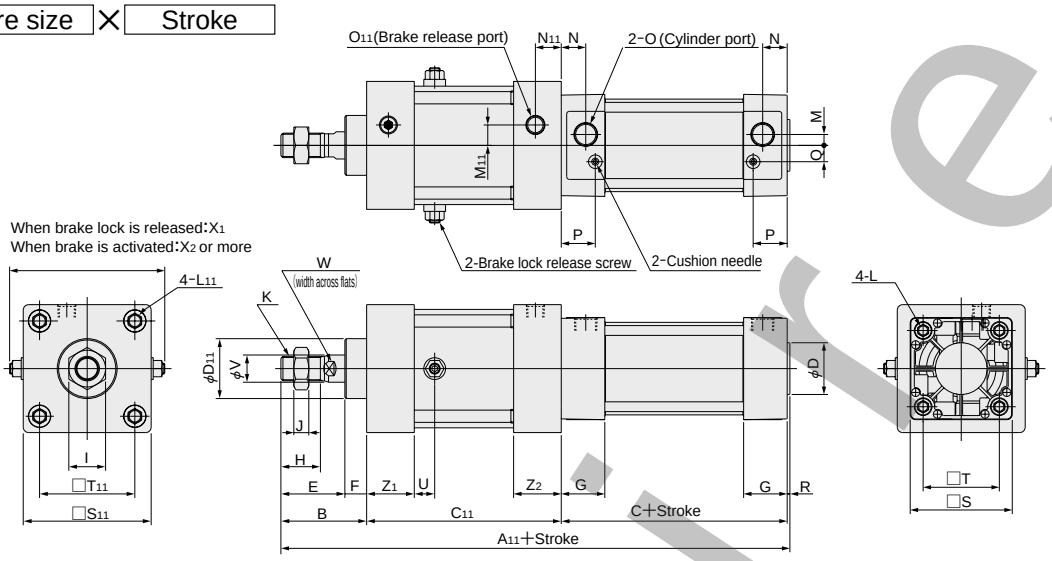
Dimensions of Single Brake, Basic Type (Unit mm)

DDAR Bore size × Stroke



Bore size \ Code	A_{11}	B	C	C_{11}	D	D_{11}	E	F	G	H	I	J	K	L	L_{11}
40	272	49	93	128	32	38	39	10	31	21	22	8	M14×1.5	M6×1 Depth14	M6×1 Depth14
50	290	57	93	138	38	38	47	10	31	29	27	11	M18×1.5	M6×1 Depth14	M8×1.25 Depth14
63	304	63	96	143	38	44	47	16	32	29	27	11	M18×1.5	M8×1.25 Depth14	M10×1.5 Depth15
80	347	75	108	162	44	50	59	16	36	37	32	13	M22×1.5	M10×1.5 Depth15	M10×1.5 Depth15
100	361	75	108	176	50	60	59	16	36	37	36	14	M26×1.5	M10×1.5 Depth15	M12×1.75 Depth15

Bore size \ Code	M	M_{11}	N	N_{11}	O	O_{11}	P	Q	R	S	S_{11}	T	T_{11}	U	V	W	X_1	X_2	Z_1	Z_2
40	4	6	18	17	Rc1/4	Rc1/4	25.5	10	2	50	62	37	47	12	16	14	88	94	27	28
50	7	11	18	17	Rc3/8	Rc1/4	24	12	2	62	75	47	56	14	20	17	97	104	30	30
63	8	15	18	22	Rc3/8	Rc1/4	25	12	2	75	94	56	70	15	20	17	114	122	35	35
80	11	15	20	24	Rc1/2	Rc3/8	29	16	2	94	112	70	84	18	25	21	134	142	35	39
100	12	15	20	24	Rc1/2	Rc3/8	29	18	2	112	138	84	104	17	30	26	159	166	36	39

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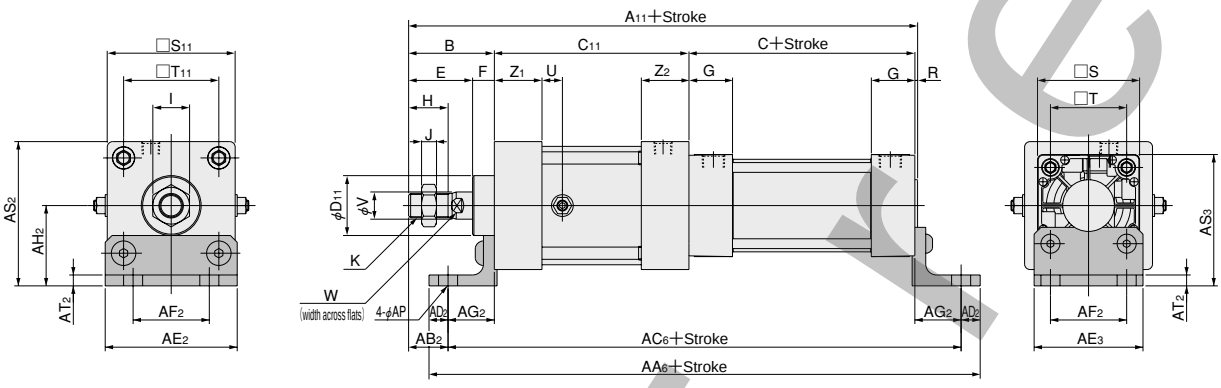
Dimensions of Single Brake, Foot Type (Unit mm)

DDAR Bore size × Stroke **-1**

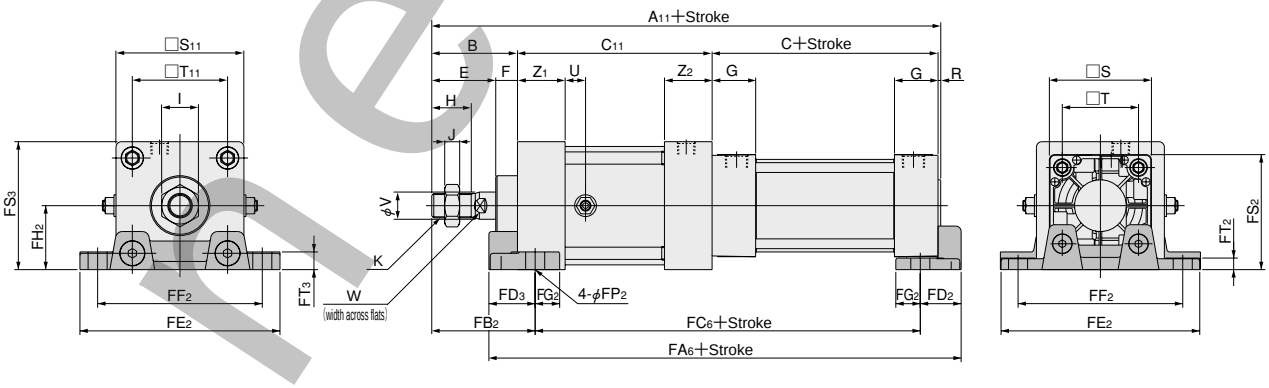


Bore size \ Code	A11	B	C	C11	D11	E	F	G	H	I	J	K
40	272	49	93	128	38	39	10	31	21	22	8	M14×1.5
50	290	57	93	138	38	47	10	31	29	27	11	M18×1.5
63	304	63	96	143	44	47	16	32	29	27	11	M18×1.5
80	347	75	108	162	50	59	16	36	37	32	13	M22×1.5
100	361	75	108	176	60	59	16	36	37	36	14	M26×1.5

Bore size \ Code	R	S	S11	T	T11	U	V	W	Z1	Z2	AA6	AB2	AC6	AD2	AE2	AE3	AF2	AG2	AH2	AP	AS2	AS3	AT2
40	2	50	62	37	47	12	16	14	27	28	297	23	273	12	70	60	37	26	41	12	72	66	6
50	2	62	75	47	56	14	20	17	30	30	311	29	287	12	80	70	47	28	48	12	85.5	79	6
63	2	75	94	56	70	15	20	17	35	35	335	29	307	14	97	80	56	34	59	14	106	96.5	8
80	2	94	112	70	84	18	25	21	35	39	366	41	338	14	114	97	70	34	66	14	122	113	8
100	2	112	138	84	104	17	30	26	36	39	406	32	370	18	138	114	84	43	79	14	148	135	10

Dimensions of Single Brake, Axis Right Angled Foot Type (Unit mm)

DDAR Bore size × Stroke **-2**



Bore size \ Code	A11	B	C	C11	E	F	G	H	I	J	K	R
40	272	49	93	128	39	10	31	21	22	8	M14×1.5	2
50	290	57	93	138	47	10	31	29	27	11	M18×1.5	2
63	304	63	96	143	47	16	32	29	27	11	M18×1.5	2
80	347	75	108	162	59	16	36	37	32	13	M22×1.5	2
100	361	75	108	176	59	16	36	37	36	14	M26×1.5	2

Bore size \ Code	S	S11	T	T11	U	V	W	Z1	Z2	FA6	FB2	FC6	FD2	FD3	FE2	FF2	FG2	FH2	FP2	FS2	FS3	FT2	FT3
40	50	62	37	47	12	16	14	27	28	248	59	201	22	25	105	83	14	31	12	56	62	5.5	9
50	62	75	47	56	14	20	17	30	30	262	67	211	24	27	117	95	14	38	12	69	75.5	6.5	9
63	75	94	56	70	15	20	17	35	35	276	76	213	29	34	147	121	18	47	14	84.5	94	8.5	13
80	94	112	70	84	18	25	21	35	39	315	88	244	33	38	168	140	18	57	14	104	113	9.5	14
100	112	138	84	104	17	30	26	36	39	336	89	257	37	42	195	167	18	69	14	125	138	11.5	16

Preview

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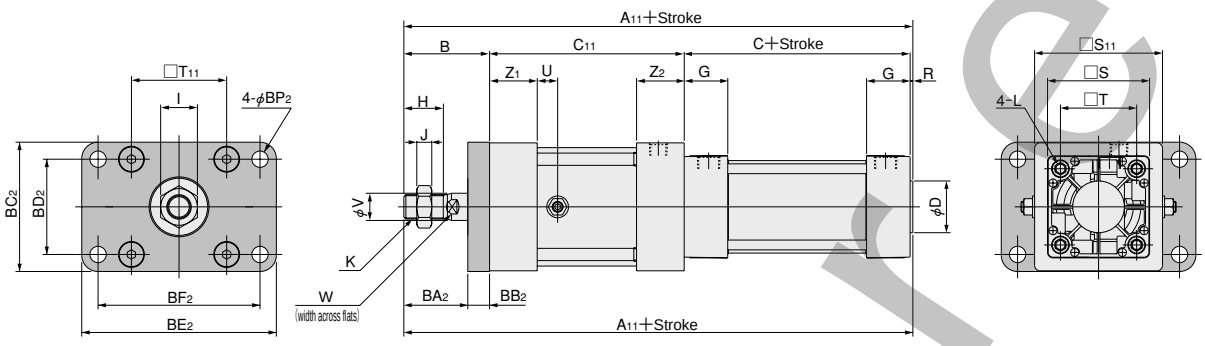
Dimensions of Single Brake, Rod Side Flange Type (Unit mm)

DDAR Bore size × Stroke **-3**

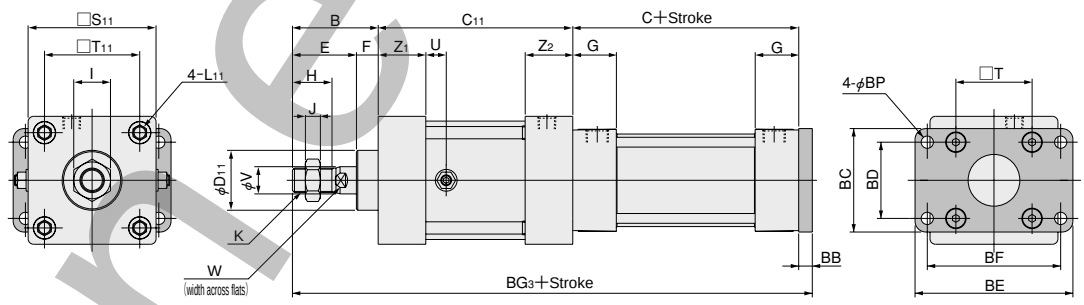


Bore size \ Code	A11	B	C	C11	D	G	H	I	J	K	L
40	272	49	93	128	32	31	21	22	8	M14×1.5	M6×1 Depth 14
50	290	57	93	138	38	31	29	27	11	M18×1.5	M6×1 Depth 14
63	304	63	96	143	38	32	29	27	11	M18×1.5	M8×1.25 Depth 14
80	347	75	108	162	44	36	37	32	13	M22×1.5	M10×1.5 Depth 15
100	361	75	108	176	50	36	37	36	14	M26×1.5	M10×1.5 Depth 15

Bore size \ Code	R	S	S11	T	T11	U	V	W	Z1	Z2	BA2	BB2	BC2	BD2	BE2	BF2	BP2
40	2	50	62	37	47	12	16	14	27	28	39	10	65	47	104	86	9
50	2	62	75	47	56	14	20	17	30	30	47	10	76	56	116	98	9
63	2	75	94	56	70	15	20	17	35	35	47	16	95	70	143	119	12
80	2	94	112	70	84	18	25	21	35	39	59	16	115	84	162	138	12
100	2	112	138	84	104	17	30	26	36	39	59	16	138	104	196	168	14

Dimensions of Single Brake, Head Side Flange Type (Unit mm)

DDAR Bore size × Stroke **-5**



Bore size \ Code	B	C	C11	D11	E	F	G	H	I	J	K	L11
40	49	93	128	38	39	10	31	21	22	8	M14×1.5	M6×1 Depth 14
50	57	93	138	38	47	10	31	29	27	11	M18×1.5	M8×1.25 Depth 14
63	63	96	143	44	47	16	32	29	27	11	M18×1.5	M10×1.5 Depth 15
80	75	108	162	50	59	16	36	37	32	13	M22×1.5	M10×1.5 Depth 15
100	75	108	176	60	59	16	36	37	36	14	M26×1.5	M12×1.75 Depth 15

Bore size \ Code	S11	T	T11	U	V	W	Z1	Z2	BB	BC	BD	BE	BF	BG3	BP
40	62	37	47	12	16	14	27	28	10	52	36	84	70	280	7
50	75	47	56	14	20	17	30	30	10	65	47	104	86	298	9
63	94	56	70	15	20	17	35	35	10	76	56	116	98	312	9
80	112	70	84	18	25	21	35	39	16	95	70	143	119	361	12
100	138	84	104	17	30	26	36	39	16	115	84	162	138	375	12

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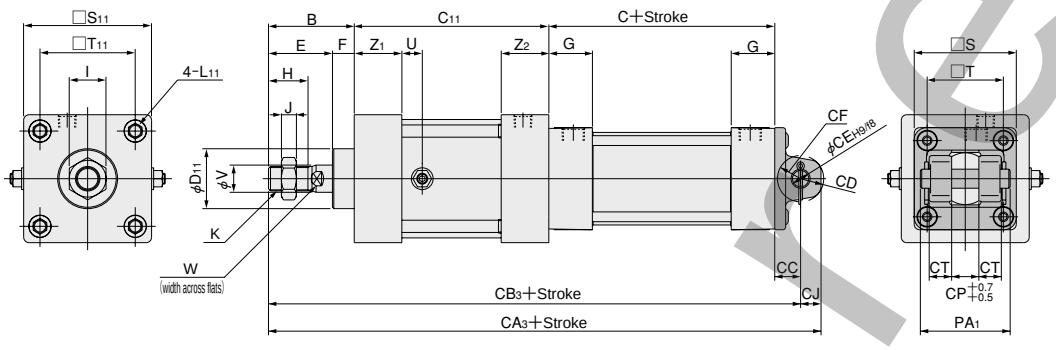
Dimensions of Single Brake, Clevis Type (Unit mm)

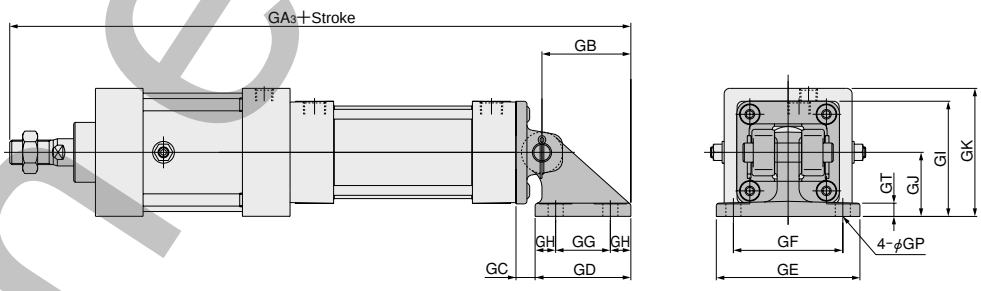
DDAR Bore size × Stroke **-7**



Bore size \ Code	B	C	C11	D11	E	F	G	H	I	J	K	L11
40	49	93	128	38	39	10	31	21	22	8	M14×1.5	M6×1 Depth 14
50	57	93	138	38	47	10	31	29	27	11	M18×1.5	M8×1.25 Depth 14
63	63	96	143	44	47	16	32	29	27	11	M18×1.5	M10×1.5 Depth 15
80	75	108	162	50	59	16	36	37	32	13	M22×1.5	M10×1.5 Depth 15
100	75	108	176	60	59	16	36	37	36	14	M26×1.5	M12×1.75 Depth 15

Bore size \ Code	S	S11	T	T11	U	V	W	Z1	Z2	CA3	CB3	CC	CD	CE	CF	CJ	CP	CT	PA1
40	50	62	37	47	12	16	14	27	28	302	289	19	R15	14	R17	13	20	12.5	58
50	62	75	47	56	14	20	17	30	30	322	307	19	R17	14	R17	15	20	16.5	66
63	75	94	56	70	15	20	17	35	35	336	321	19	R17	14	R17	15	20	16.5	66
80	94	112	70	84	18	25	21	35	39	398	377	32	R24	20	R30	21	32	17.5	78
100	112	138	84	104	17	30	26	36	39	412	391	32	R24	20	R30	21	32	17.5	78

●With Supporting Bracket **DDAR** Bore size × Stroke **-7-7C**



Bore size \ Code	GA3	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GP	GT
40	355.5	66.5	12.5	73	105	80	40	16.5	70	45	76	11(Thru hole)	8
50	373.5	66.5	12.5	73	105	80	40	16.5	76	45	82.5	11(Thru hole)	8
63	387.5	66.5	12.5	73	105	80	40	16.5	82.5	45	92	11(Thru hole)	8
80	463.5	86.5	20.5	98	135	105	65	16.5	107	60	116	14(Thru hole)	12
100	477.5	86.5	20.5	98	135	105	65	16.5	116	60	129	14(Thru hole)	12

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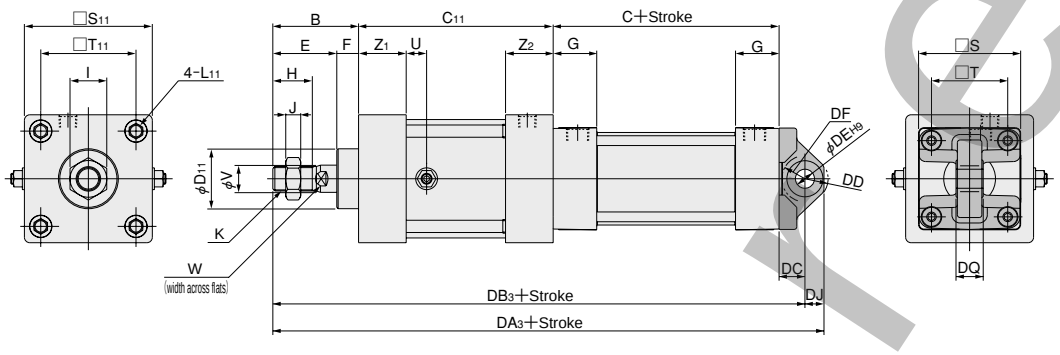
Dimensions of Single Brake, Pivot Mounting Type (Unit mm)

DDAR Bore size × Stroke **-8**



Bore size \ Code	B	C	C11	D11	E	F	G	H	I	J	K	L11
40	49	93	128	38	39	10	31	21	22	8	M14×1.5	M6×1 Depth 14
50	57	93	138	38	47	10	31	29	27	11	M18×1.5	M8×1.25 Depth 14
63	63	96	143	44	47	16	32	29	27	11	M18×1.5	M10×1.5 Depth 15
80	75	108	162	50	59	16	36	37	32	13	M22×1.5	M10×1.5 Depth 15
100	75	108	176	60	59	16	36	37	36	14	M26×1.5	M12×1.75 Depth 15

Bore size \ Code	S	S11	T	T11	U	V	W	Z1	Z2	DA3	DB3	DC	DD	DE	DF	DJ	DQ
40	50	62	37	47	12	16	14	27	28	303	289	19	R17	14	R17	14	$20^{0}_{-0.084}$
50	62	75	47	56	14	20	17	30	30	321	307	19	R17	14	R17	14	$20^{0}_{-0.084}$
63	75	94	56	70	15	20	17	35	35	335	321	19	R17	14	R17	14	$20^{0}_{-0.084}$
80	94	112	70	84	18	25	21	35	39	398	377	32	R24	20	R25	21	$32^{0}_{-0.100}$
100	112	138	84	104	17	30	26	36	39	411	391	32	R24	20	R26	20	$32^{0}_{-0.100}$

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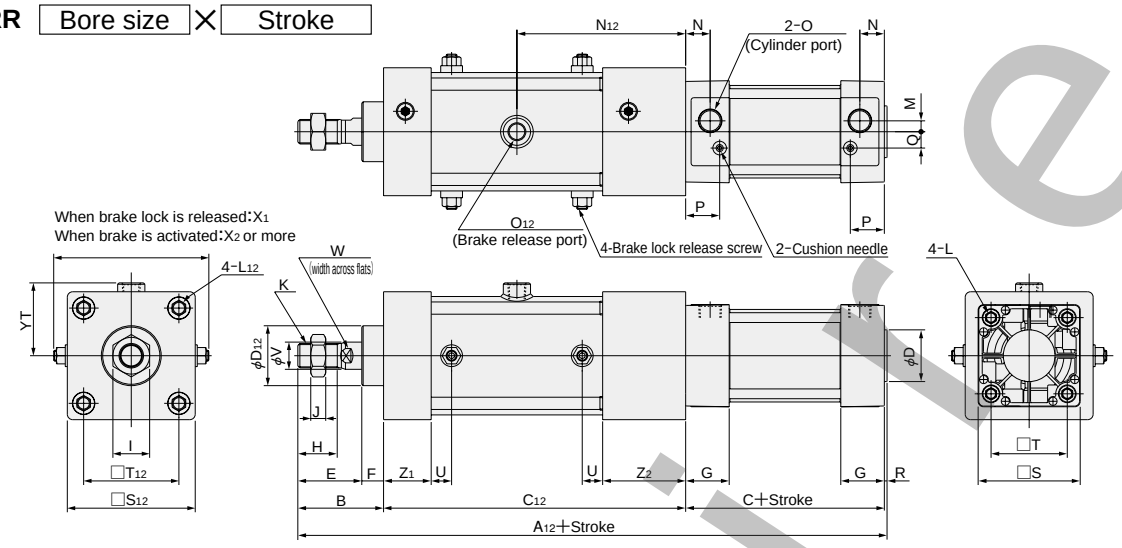
Dimensions of Double Brake, Basic Type (Unit mm)

DDARR Bore size × Stroke



Bore size \ Code	A12	B	C	C12	D	D12	E	F	G	H	I	J	K	L	L12
40	350	49	93	206	32	38	39	10	31	21	22	8	M14×1.5	M6×1 Depth14	M6×1 Depth14
50	374	57	93	222	38	38	47	10	31	29	27	11	M18×1.5	M6×1 Depth14	M8×1.25 Depth14
63	383	63	96	222	38	44	47	16	32	29	27	11	M18×1.5	M8×1.25 Depth14	M10×1.5 Depth15
80	439	75	108	254	44	50	59	16	36	37	32	13	M22×1.5	M10×1.5 Depth15	M10×1.5 Depth15
100	467	75	108	282	50	60	59	16	36	37	36	14	M26×1.5	M10×1.5 Depth15	M12×1.75 Depth15

Bore size \ Code	M	N	N12	O	O12	P	Q	R	S	S12	T	T12	U	V	W	X1	X2	YT	Z1	Z2
40	4	18	116	Rc1/4	Rc1/4	25.5	10	2	50	62	37	47	12	16	14	88	94	37.5	27	53
50	7	18	124	Rc3/8	Rc1/4	24	12	2	62	75	47	56	14	20	17	97	104	44	30	56
63	8	18	124	Rc3/8	Rc1/4	25	12	2	75	94	56	70	15	20	17	114	122	53.5	35	61
80	11	20	143	Rc1/2	Rc3/8	29	16	2	94	112	70	84	18	25	21	134	142	68.5	35	67
100	12	20	157	Rc1/2	Rc3/8	29	18	2	112	138	84	104	17	30	26	159	166	82	36	68

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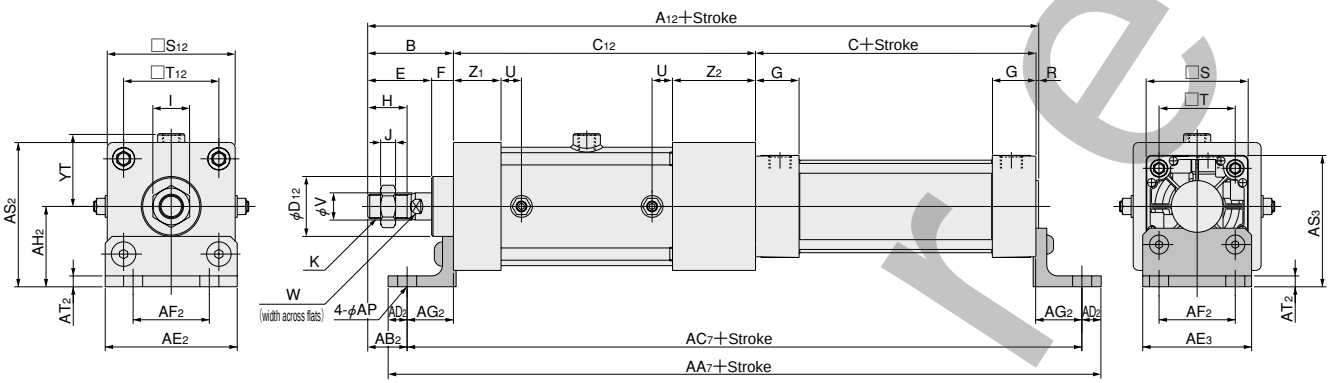
Dimensions of Double Brake, Foot Mounting Type (Unit mm)

DDARR Bore size × Stroke **-1**

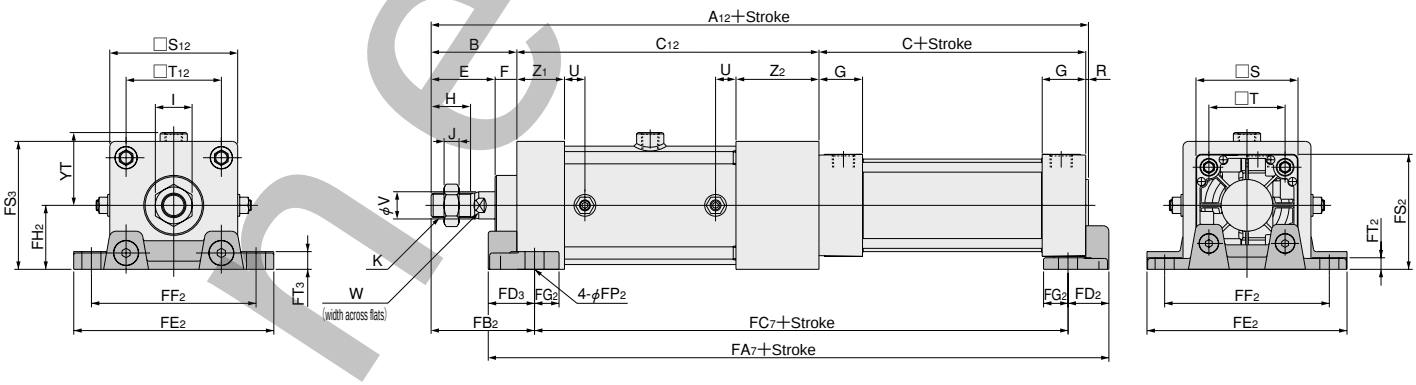


Bore size \ Code	A12	B	C	C12	D12	E	F	G	H	I	J	K	R
40	350	49	93	206	38	39	10	31	21	22	8	M14×1.5	2
50	374	57	93	222	38	47	10	31	29	27	11	M18×1.5	2
63	383	63	96	222	44	47	16	32	29	27	11	M18×1.5	2
80	439	75	108	254	50	59	16	36	37	32	13	M22×1.5	2
100	467	75	108	282	60	59	16	36	37	36	14	M26×1.5	2

Bore size \ Code	S	S12	T	T12	U	V	W	YT	Z1	Z2	AA7	AB2	AC7	AD2	AE2	AE3	AF2	AG2	AH2	AP	AS2	AS3	AT2
40	50	62	37	47	12	16	14	37.5	27	53	375	23	351	12	70	60	37	26	41	12	72	66	6
50	62	75	47	56	14	20	17	44	30	56	395	29	371	12	80	70	47	28	48	12	85.5	79	6
63	75	94	56	70	15	20	17	53.5	35	61	414	29	386	14	97	80	56	34	59	14	106	96.5	8
80	94	112	70	84	18	25	21	68.5	35	67	458	41	430	14	114	97	70	34	66	14	122	113	8
100	112	138	84	104	17	30	26	82	36	68	512	32	476	18	138	114	84	43	79	14	148	135	10

Dimensions of Double Brake, Axis Right Angled Foot Mounting Type (Unit mm)

DDARR Bore size × Stroke **-2**



Bore size \ Code	A12	B	C	C12	E	F	G	H	I	J	K	R	S
40	350	49	93	206	39	10	31	21	22	8	M14×1.5	2	50
50	374	57	93	222	47	10	31	29	27	11	M18×1.5	2	62
63	383	63	96	222	47	16	32	29	27	11	M18×1.5	2	75
80	439	75	108	254	59	16	36	37	32	13	M22×1.5	2	94
100	467	75	108	282	59	16	36	37	36	14	M26×1.5	2	112

Bore size \ Code	S12	T	T12	U	V	W	YT	Z1	Z2	FA7	FB2	FC7	FD2	FD3	FE2	FF2	FG2	FH2	FP2	FS2	FS3	FT2	FT3
40	62	37	47	12	16	14	37.5	27	53	326	59	279	22	25	105	83	14	31	12	56	62	5.5	9
50	75	47	56	14	20	17	44	30	56	346	67	295	24	27	117	95	14	38	12	69	75.5	6.5	9
63	94	56	70	15	20	17	53.5	35	61	355	76	292	29	34	147	121	18	47	14	84.5	94	8.5	13
80	112	70	84	18	25	21	68.5	35	67	407	88	336	33	38	168	140	18	57	14	104	113	9.5	14
100	138	84	104	17	30	26	82	36	68	442	89	363	37	42	195	167	18	69	14	125	138	11.5	16

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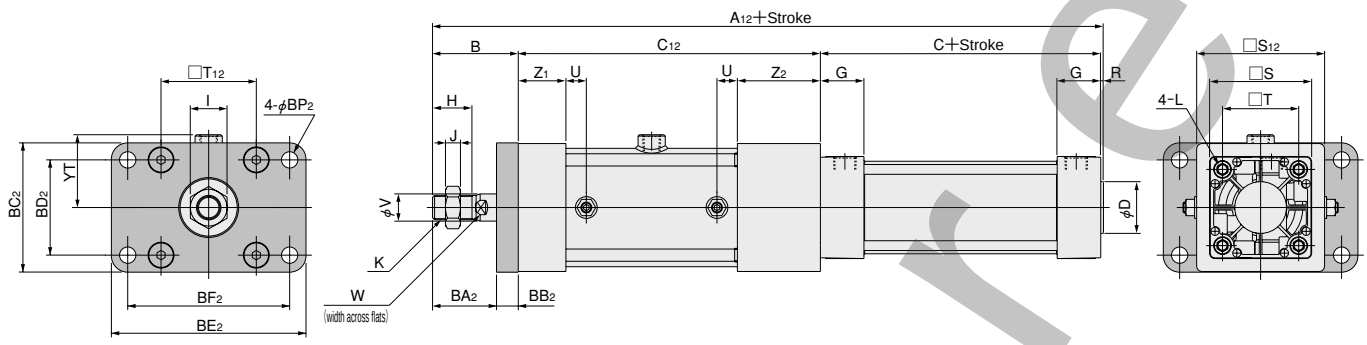
Dimensions of Double Brake, Rod Side Flange Mounting Type (Unit mm)

DDARR Bore size × Stroke **-3**

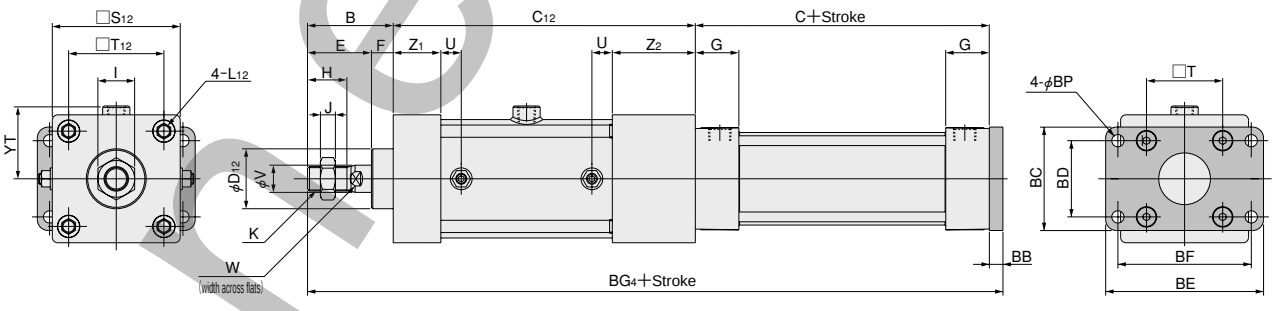


Bore size \ Code	A12	B	C	C12	D	G	H	I	J	K	L
40	350	49	93	206	32	31	21	22	8	M14×1.5	M6×1 Depth 14
50	374	57	93	222	38	31	29	27	11	M18×1.5	M6×1 Depth 14
63	383	63	96	222	38	32	29	27	11	M18×1.5	M8×1.25 Depth 14
80	439	75	108	254	44	36	37	32	13	M22×1.5	M10×1.5 Depth 15
100	467	75	108	282	50	36	37	36	14	M26×1.5	M10×1.5 Depth 15

Bore size \ Code	R	S	S12	T	T12	U	V	W	YT	Z1	Z2	BA2	BB2	BC2	BD2	BE2	BF2	BP2
40	2	50	62	37	47	12	16	14	37.5	27	53	39	10	65	47	104	86	9
50	2	62	75	47	56	14	20	17	44	30	56	47	10	76	56	116	98	9
63	2	75	94	56	70	15	20	17	53.5	35	61	47	16	95	70	143	119	12
80	2	94	112	70	84	18	25	21	68.5	35	67	59	16	115	84	162	138	12
100	2	112	138	84	104	17	30	26	82	36	68	59	16	138	104	196	168	14

Dimensions of Double Brake, Head Side Flange Mounting Type (Unit mm)

DDARR Bore size × Stroke **-5**



Bore size \ Code	B	C	C12	D12	E	F	G	H	I	J	K	L12
40	49	93	206	38	39	10	31	21	22	8	M14×1.5	M6×1 Depth 14
50	57	93	222	38	47	10	31	29	27	11	M18×1.5	M8×1.25 Depth 14
63	63	96	222	44	47	16	32	29	27	11	M18×1.5	M10×1.5 Depth 15
80	75	108	254	50	59	16	36	37	32	13	M22×1.5	M10×1.5 Depth 15
100	75	108	282	60	59	16	36	37	36	14	M26×1.5	M12×1.75 Depth 15

Bore size \ Code	S12	T	T12	U	V	W	YT	Z1	Z2	BB	BC	BD	BE	BF	BG4	BP
40	62	37	47	12	16	14	37.5	27	53	10	52	36	84	70	358	7
50	75	47	56	14	20	17	44	30	56	10	65	47	104	86	382	9
63	94	56	70	15	20	17	53.5	35	61	10	76	56	116	98	391	9
80	112	70	84	18	25	21	68.5	35	67	16	95	70	143	119	453	12
100	138	84	104	17	30	26	82	36	68	16	115	84	162	138	481	12

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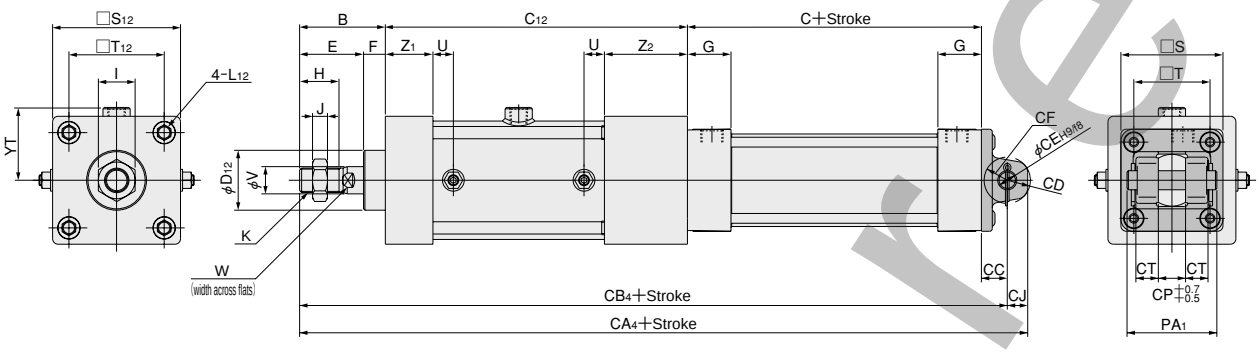
Dimensions of Double Brake, Clevis Mounting Type (Unit mm)

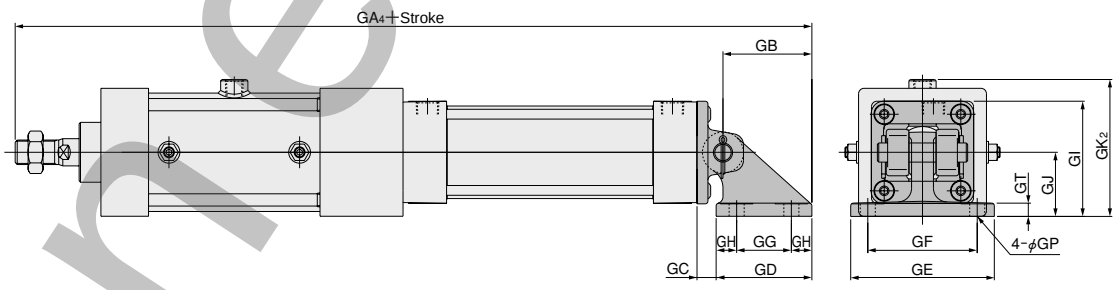
DDARR Bore size × Stroke **-7**



Bore size \ Code	B	C	C12	D12	E	F	G	H	I	J	K	L12
40	49	93	206	38	39	10	31	21	22	8	M14×1.5	M6×1 Depth 14
50	57	93	222	38	47	10	31	29	27	11	M18×1.5	M8×1.25 Depth 14
63	63	96	222	44	47	16	32	29	27	11	M18×1.5	M10×1.5 Depth 15
80	75	108	254	50	59	16	36	37	32	13	M22×1.5	M10×1.5 Depth 15
100	75	108	282	60	59	16	36	37	36	14	M26×1.5	M12×1.75 Depth 15

Bore size \ Code	S	S12	T	T12	U	V	W	YT	Z1	Z2	CA4	CB4	CC	CD	CE	CF	CJ	CP	CT	PA1
40	50	62	37	47	12	16	14	37.5	27	53	380	367	19	R15	14	R17	13	20	12.5	58
50	62	75	47	56	14	20	17	44	30	56	406	391	19	R17	14	R17	15	20	16.5	66
63	75	94	56	70	15	20	17	53.5	35	61	415	400	19	R17	14	R17	15	20	16.5	66
80	94	112	70	84	18	25	21	68.5	35	67	490	469	32	R24	20	R30	21	32	17.5	78
100	112	138	84	104	17	30	26	82	36	68	518	497	32	R24	20	R30	21	32	17.5	78

●With Supporting Bracket **DDARR** Bore size × Stroke **-7-7C**



Bore size \ Code	GA4	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK2	GP	GT
40	433.5	66.5	12.5	73	105	80	40	16.5	70	45	82.5	11(Thru hole)	8
50	457.5	66.5	12.5	73	105	80	40	16.5	76	45	89	11(Thru hole)	8
63	466.5	66.5	12.5	73	105	80	40	16.5	82.5	45	98.5	11(Thru hole)	8
80	555.5	86.5	20.5	98	135	105	65	16.5	107	60	128.5	14(Thru hole)	12
100	583.5	86.5	20.5	98	135	105	65	16.5	116	60	142	14(Thru hole)	12

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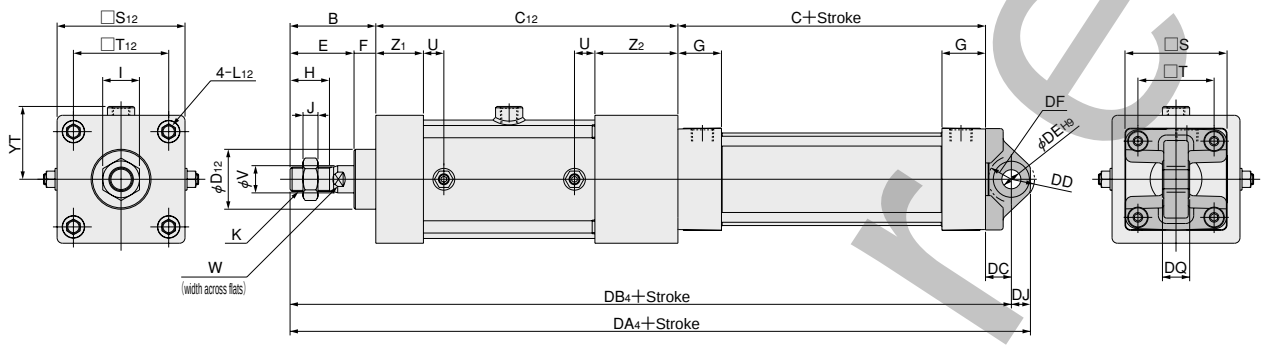
Dimensions of Double Brake, Pivot Mounting Type (Unit mm)

DDARR Bore size × Stroke **-8**



Bore size \ Code	B	C	C_{12}	D_{12}	E	F	G	H	I	J	K	L_{12}
40	49	93	206	38	39	10	31	21	22	8	M14×1.5	M6×1 Depth 14
50	57	93	222	38	47	10	31	29	27	11	M18×1.5	M8×1.25 Depth 14
63	63	96	222	44	47	16	32	29	27	11	M18×1.5	M10×1.5 Depth 15
80	75	108	254	50	59	16	36	37	32	13	M22×1.5	M10×1.5 Depth 15
100	75	108	282	60	59	16	36	37	36	14	M26×1.5	M12×1.75 Depth 15

Bore size \ Code	S	S_{12}	T	T_{12}	U	V	W	YT	Z_1	Z_2	DA_4	DB_4	DC	DD	DE	DF	DJ	DQ
40	50	62	37	47	12	16	14	37.5	27	53	381	367	19	R17	14	R17	14	$20^{\ 0}_{-0.084}$
50	62	75	47	56	14	20	17	44	30	56	405	391	19	R17	14	R17	14	$20^{\ 0}_{-0.084}$
63	75	94	56	70	15	20	17	53.5	35	61	414	400	19	R17	14	R17	14	$20^{\ 0}_{-0.084}$
80	94	112	70	84	18	25	21	68.5	35	67	490	469	32	R24	20	R25	21	$32^{\ 0}_{-0.100}$
100	112	138	84	104	17	30	26	82	36	68	517	497	32	R24	20	R26	20	$32^{\ 0}_{-0.100}$

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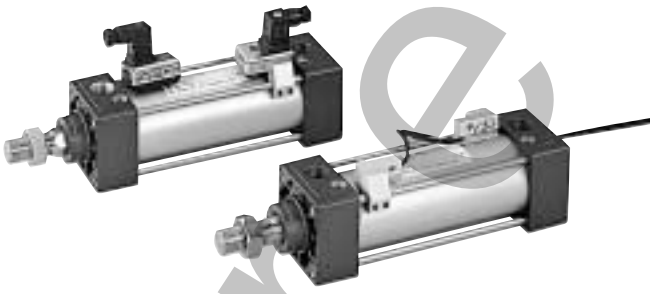
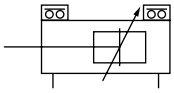
Sensor Switches



Symbol



Specifications

●Solid state type

Item \ Model	ZC130□	ZC153□
Wiring type	2-lead wires	3-lead wires
Power supply voltage	—	DC4.5～28V
Load voltage	DC10～28V	DC4.5～28V
Load current	4～50mA	100mA MAX.
Consumption current	—	10mA MAX. (at DC24V)
Internal voltage drop Note 1	3.5V MAX.	0.5V MAX.(When load current is 50mA)
Leakage current	1mA MAX. (at DC24V)	50 μA MAX. (at DC24V)
Response time	1ms MAX.	
Insulation resistance	100MΩ MIN. (at DC500V, between case and lead wire terminals)	
Dielectric strength	AC500V (50/60Hz) for 1 minute (Between case and lead wire terminals)	
Shock resistance Note 2	294.2m/s² {30G} (non-repeating)	
Vibration resistance Note 2	88.3m/s² {9G} (Total amplitude 1.5mm, 10～55Hz)	
Environmental protection	IP67 (IEC standard), JIS C0920 (watertight type)	
Operating indicator	When ON, a red LED indicator lights up	
Lead wire Note 3	PVC 0.2SQ×2 leads× ℓ	PVC 0.2SQ×3 leads× ℓ
Ambient temperature	0～60˚C	
Storage temperature range	−10～70˚C	
Mass	20g (Lead wire length A : 1000mm)	

Notes: 1. Internal voltage drop varies according to the load current.
2. According to Koganei test standards.
3. Lead wire length ℓ : A ; 1000mm, B ; 3000mm

●Reed switch type

Item \ Model	CS5T□	CS11T□
Wiring type	2-lead wires	
Load voltage	DC5～28V AC85～115V (r.m.s.)	DC10～28V
Load current	DC0.1～40mA AC2～25mA	DC5～40mA
Internal voltage drop	0.1V MAX. (When load current is 40mA)	2.1V MAX. (When load current is 40mA) Note 1
Leakage current	0mA	
Response time	1ms MAX.	
Insulation resistance	100MΩ MIN. (at DC500V, between case and lead wire terminals)	
Dielectric resistance	AC1500V (50/60Hz) for 1 minute (Between case and lead wire terminals)	AC1000V (50/60Hz) for 1 minute (Between case and lead wire terminals)
Shock resistance Note 2	294.2m/s² {30G} (non-repeating)	
Vibration resistance Note 2	88.3m/s² {9G} (total amplitude 1.5mm･10～55Hz) Resonance frequency 2750±250Hz	
Environmental protection	IP67 (IEC standard), JIS C0920 (watertight type)	
Operating indicator	—	When ON, a red LED indicator lights up
Lead wire Note 3	PVC 0.2SQ×2 leads× ℓ	
Electric life cycle Note 2	5×10⁶ cycles MIN.	
Ambient temperature	0～60˚C	
Storage temperature range	−10～70˚C	
Contact protection	Required (See the contact protection measures on p. 101)	
Mass	20g (Lead wire length A : 1000mm)	

Notes: 1. Internal voltage drop varies according to the load current.
2. According to Koganei test standards.
3. Lead wire length ℓ : A ; 1000mm, B ; 3000mm

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Specifications

●Reed switch type

Item \ Model	CS2F	CS3F	CS4F	CS5F
Wiring type	2-lead wires			
Load voltage	AC85～230V(r.m.s.)	DC5～30V	DC5～30V	DC3～30V
Load current	2～200mA	10～46mA[Note 1]	5～25mA[Note 1]	0.1～80mA
Internal voltage drop	0.1V MAX.(When load current is 200mA)	2V MAX.(When load current is 46mA)[Note 2]	1.8V MAX.(When load current is 25mA)[Note 2]	0.1V MAX.(When load current is 80mA)
Leakage current	1mA MAX.(at AC100V) 2mA MAX.(at AC200V)	0mA		
Response time	2ms MAX.	1.2ms MAX.		
Insulation resistance	100MΩ MIN. (at DC500V, between case and lead wire terminals)			
Dielectric strength	AC500V (50/60Hz) for 1 minute (between case and lead wire terminals)			
Shock resistance[Note 3]	294.2m/s² {30G} (non-repeating)			
Vibration resistance[Note 3]	88.3m/s² {9G} (Total amplitude 1.5mm・10～55Hz) Resonance frequency 5000±400Hz			
Environmental protection	—			
Operating indcator	When ON, a red neon lamp turn off	When ON, a red LED indicator lights up		—
Wiring	With DIN connector (cabtire outer diameter φ 6.5 MAX., lead wire φ 1.25SQ MAX.)			
Electric life cycle[Note 3]	5×10⁶ cycles MIN.			
Ambient temperature	0～60˚C			
Storage temperature range	−10～70˚C			
Contact protection	Not required	Required (See the Contact protection on p. 101.)		
Mass	40g			

Notes: 1. Ta=37˚C
2. Internal voltage drop varies according to the load current.
3. According to Koganei test standards.

Order Code

●Without mounting holder — **ZC130** **A**

●With mounting holder — **ZC130** **A** − **NDDA** **40**

Sensor switch model
- **ZC130** — 2-lead wires Solid state type with indicator lamp DC10～28V
- **ZC153** — 3-lead wires Solid state type with indicator lamp DC4.5～28V
- **CS5T** — 2-lead wires Reed switch type without indicator lamp DC5～28V, AC85～115V
- **CS11T** — 2-lead wires Reed switch type with indicator lamp DC10～28V
- **CS2F** — DIN type Reed switch type with indicator lamp AC85～230V
- **CS3F** — DIN type Reed switch type with indicator lamp DC10～30V
- **CS4F** — DIN type Reed switch type with indicator lamp DC10～30V
- **CS5F** — DIN type Reed switch type without indicator lamp DC3～30V

Lead wire length (Applicable to other than **CS□F** only)
- **A** — 1000mm
- **B** — 3000mm

NDDA: Applicable to other than CS□F
NDF : Applicable to CS□F only

Bore size

●**Order code for mounting holders only**

C1 − **NDDA** **40**

Sensor type
- **C1**: Solid state type for **ZC1□□** Reed switch type for **CS□T**
- **DF**: Reed switch type for **CS□F**

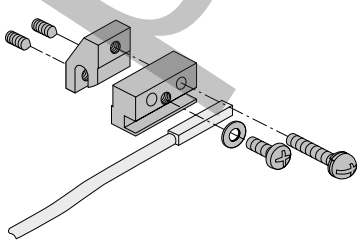
NDDA: Applicable to other than **CS□F**
Blank : For **CS□F**

Bore size
- **32** — For φ 32
- **40** — For φ 40
- **50** — For φ 50
- **63** — For φ 63
- **80** — For φ 80
- **100** — For φ 100
- **125** — For φ 125

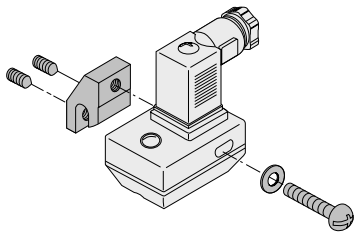
Sensor Switches and Mounting Holders

●New Dyna cylinder sensor switches come in two types, and two corresponding types of mounting holders are available. See the following for details.

Solid state type	**ZC130□□** **ZC153□□**
Reed switch type	**CS5T□** **CS11T□**



DIN connector	**CS2F** **CS3F** **CS4F** **CS5F**



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Smallest Cylinder Stroke where Sensor Switch Can Be Used

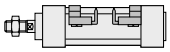
mm

Sensor switch type		Bore size	2pcs. mounting				1pc. mounting	
			When mounted on one tie rod		When mounted on two tie rods		Rod side	Head side
			On straight line	with staggered position	When mounted on one surface	When mounted on two surfaces		
Solid state type	ZC130 ZC153	32	50 (85)	10 (85)	43 (85)	10 (85)	10 (85)	10 (61)
		40	50 (85)	10 (85)	43 (85)	10 (85)	10 (85)	10 (61)
		50	50 (85)	10 (85)	10 (85)	10 (85)	10 (85)	10 (61)
		63	53 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (58)
		80	53 (94)	10 (94)	10 (94)	10 (94)	10 (94)	10 (64)
		100	53 (94)	10 (94)	10 (94)	10 (94)	10 (94)	10 (64)
		125	53 (94)	10 (94)	10 (94)	10 (94)	10 (94)	10 (64)
Reed switch type	CS5T CS11T	32	50 (85)	10 (85)	43 (85)	10 (85)	10 (85)	10 (61)
		40	50 (85)	10 (85)	43 (85)	10 (85)	10 (85)	10 (61)
		50	50 (85)	10 (85)	10 (85)	10 (85)	10 (85)	10 (61)
		63	53 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (58)
		80	53 (94)	10 (94)	10 (94)	10 (94)	10 (94)	10 (64)
		100	53 (94)	10 (94)	10 (94)	10 (94)	10 (94)	10 (64)
		125	53 (94)	10 (94)	10 (94)	10 (94)	10 (94)	10 (64)
	CS□F	32	50 (88)	28 (88)	50 (88)	20 (88)	15 (88)	15 (72)
		40	50 (88)	28 (88)	50 (88)	20 (88)	15 (88)	15 (72)
		50	50 (88)	28 (88)	50 (88)	20 (88)	15 (88)	15 (72)
		63	50 (91)	28 (91)	50 (91)	20 (91)	15 (91)	15 (69)
		80	50 (96)	28 (96)	20 (96)		15 (96)	15 (74)
		100	50 (94)	28 (101)	20 (101)		15 (101)	15 (79)
		125	50 (94)	28 (101)	20 (101)		15 (101)	15 (79)

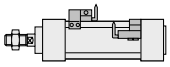
Remark: Figures in parentheses ( ) are for trunnion type.

●When mounted on one tie rod

On straight line

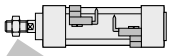


With staggered position

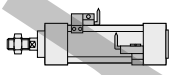


●When mounted on two tie rods

When mounted on one surface

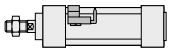


When mounted on two surface

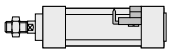


●1pc. mounting

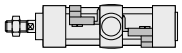
Rod side



Head side

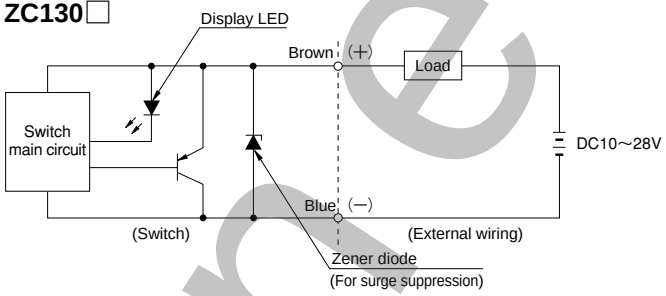


●Trunnion type

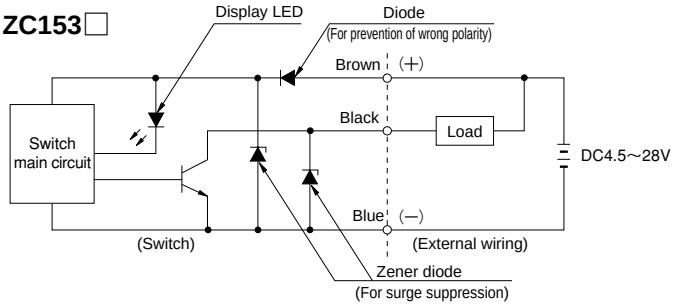


Internal Circuit

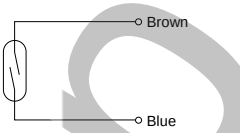
ZC130□



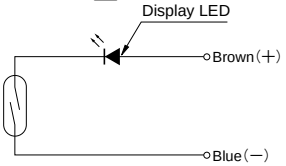
ZC153□



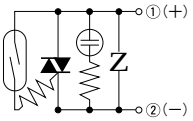
CS5T□



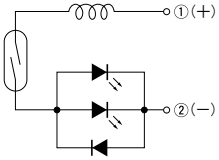
CS11T□



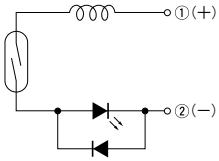
CS2F



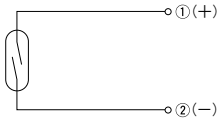
CS3F



CS4F



CS5F



●○Figure shows terminal numbers of F type connectors.

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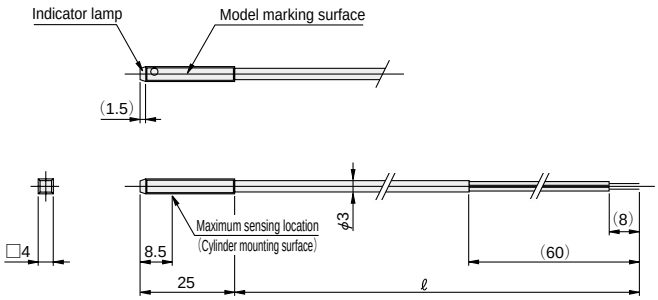
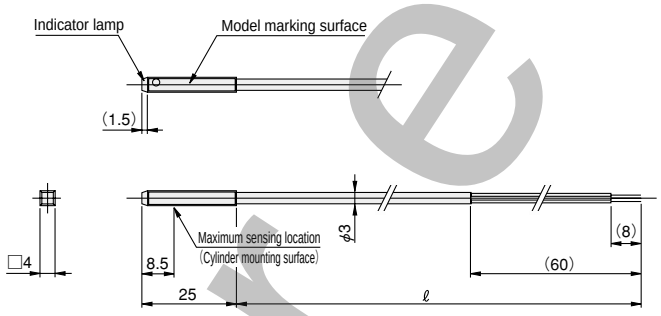
Dimensions of Sensor Switch (Unit mm)

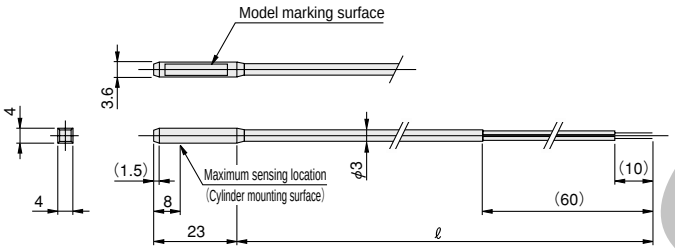
ZC130□



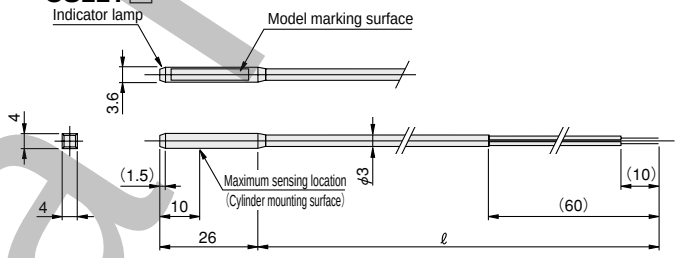
ZC153□



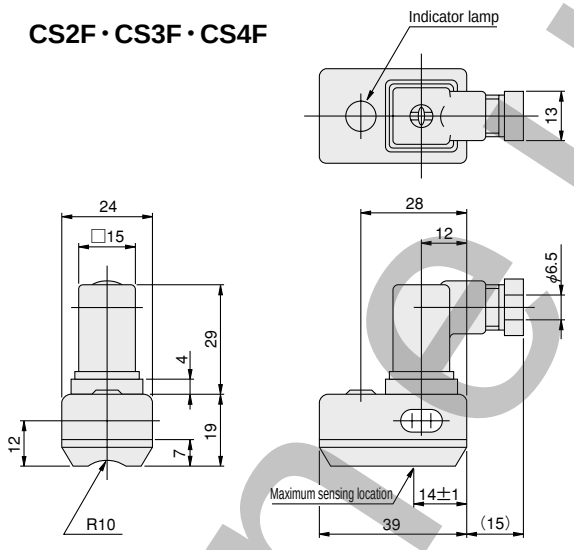
CS5T□



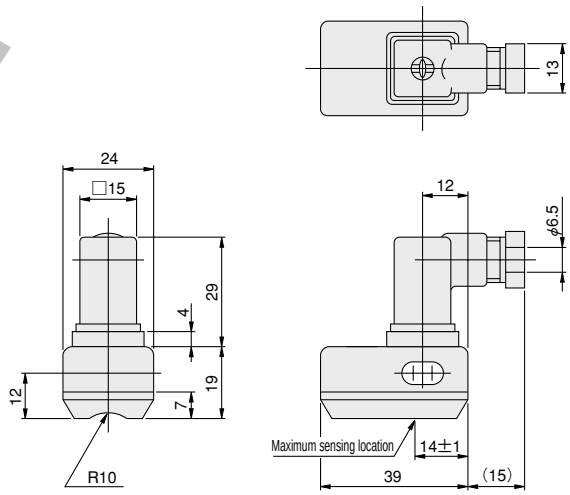
CS11T□



CS2F・CS3F・CS4F



CS5F



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Sensor Switch Operating Range, Response Differential and Maximum Sensing Location

●ZC1□□type, CS□T type, CS□F type

●Operating range: ℓ

The distance the piston travels in one direction while the switch is in the ON position.

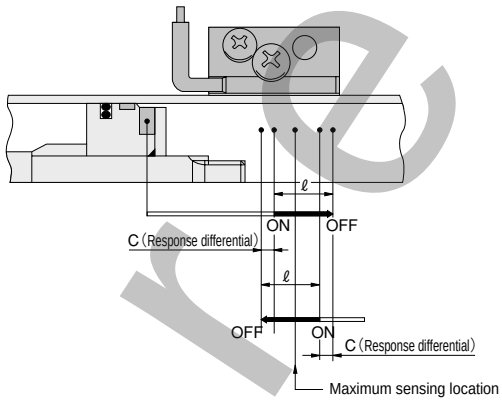
●Response differential: C

The distance between the point where the piston turns the switch ON, and the point where the switch turns OFF as the piston travels in the opposite direction.

mm

Sensor switches type	Solid state type	Reed switch type		
	ZC130, ZC153	CS5T	CS11T	CS□F
Operating range: ℓ	2～6	6～15		
Response differential: C	1.5MAX.	2.5MAX.		
Maximum sensing location	8.5	7	10.5	16

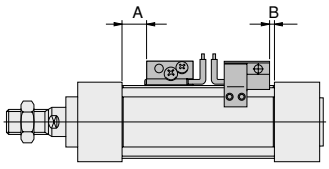
Notes: 1. The grommet type figure is from the surface opposite to the surface of the lead wire side, while the connector type figure is from the connector side's end surface.
2. Figures in the table above are reference values.



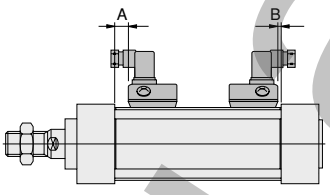
Mounting Location of Sensor Switch

When the sensor switch is mounted in the location shown in the diagram (figures in the table are reference values), the magnet comes to the sensor switch's maximum sensing location at the end of the stroke.

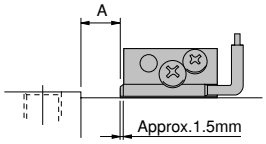
●Grommet type



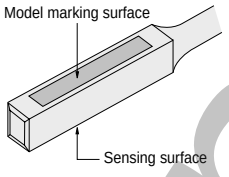
●Conector type



Grommet type enlarged view



●Precaution for mounting



For the ZC type sensor switch, the surface opposite to the model marking surface is the sensing surface side. Mount so that the cylinder magnet comes to the sensing surface side.

●Single rod basic type and non-rotating double rod type

mm

Sensor switch type		Bore size / Code	32	40	50	63	80	100	125
Solid state type	ZC130	A	9	9	9	9.5	12.5	12.5	14.5
	ZC153	B	5	5	5	5.5	6.5	6.5	10.5
Reed switch type	CS5T	A	10.5	10.5	10.5	11	14	14	16
		B	6.5	6.5	6.5	7	8	8	12
	CS11T	A	7	7	7	7.5	10.5	10.5	12.5
		B	3	3	3	3.5	4.5	4.5	8.5
	CS□F	A	3.5	3.5	3.5	4	7	7	9
		B	0	0	0	0	1	1	5

Caution: The reed type sensor switch cannot be mounted on the head side in any direction other than that shown in the diagram.

●Standard doulbe rod

mm

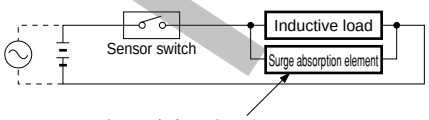
Sensor switch type		Bore size / Code	32	40	50	63	80	100	125
Solid state type	ZC130	A	9.5	9	9.5	9.5	12.5	12.5	14.5
	ZC153	B	4.5	5	4.5	5.5	6.5	6.5	10.5
Reed switch type	CS5T	A	11	10.5	11	11	14	14	16
		B	6	6.5	6	7	8	8	12
	CS11T	A	7.5	7	7.5	7.5	10.5	10.5	12.5
		B	2.5	3	2.5	3.5	4.5	4.5	8.5
	CS□F	A	4	3.5	4	4	7	7	9
		B	0	0	0	0	1	1	5

Caution: The reed type sensor switch cannot be mounted on the head side in any direction other than that shown in the diagram.

Contact Protection for Reed Type Sensor Switch

In order to use the reed type sensor switch in a stabilized condition, the following contact protection should be used.

●When you connect inductive load (electromagnetic relay etc.)

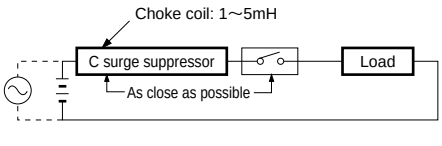


For DC……Diode or CR, etc.
For AC……CR, etc.
Diode: Forward direction requires circuit current or higher, reverse direction requires reverse dielectric strength is 10 times of circuit voltage or more.

C: 0.01～0.1 μF
R: 1～4kΩ

●When capacity serge is generated

(When lead wire length exceeds 10m.)



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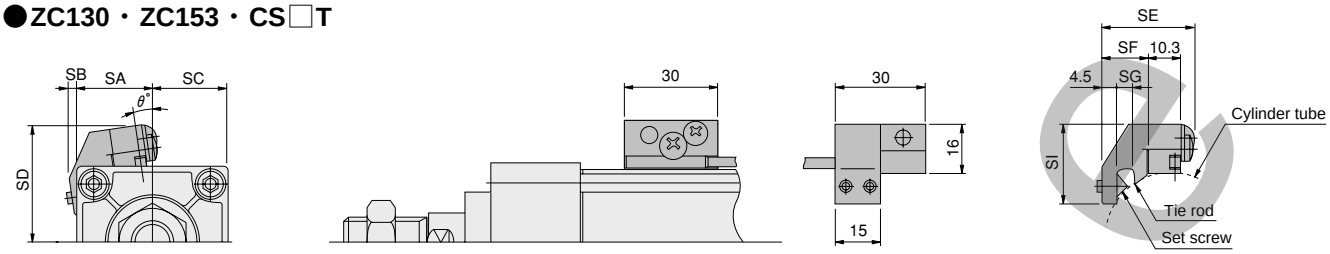
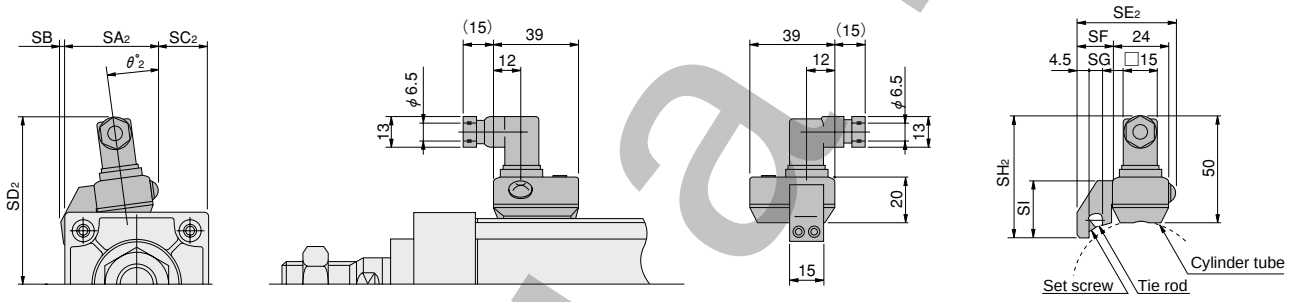
Dimensions of Sensor Switch

●ZC130・ZC153・CS□T



Bore size \ Code	SA	SB	SC	SD	SE	SF	SG	SI	θ
32	27	5	17	35	29.8	15.5	6	25.5	1
40	26.1	2	23.9	38.4	29.8	15.5	6	25.5	10
50	27.1	0.7	34.9	43.4	29.8	15.5	6	25.5	10
63	28.3	0	46.7	48.6	31.8	17.5	8	24.5	18
80	30.9	0	63.1	55.9	33.3	19	9.5	22.5	22
100	32.2	0	79.8	63.6	33.3	19	9.5	22.5	24.5
125	36.5	—	99.5	75	37.5	24.8	11	15.5	27.5

●CS□F



Bore size \ Code	SA2	SB	SC2	SD2	SE2	SF	SG	SH2	SI	θ 2
32	41.5	5	2.5	66.5	43	15.5	6	56.5	25.5	2.3
40	33.5	1.5	16.5	70	43	15.5	6	56.5	25.5	12
50	40	0.5	22	74.5	43	15.5	6	56.5	25.5	10
63	40.5	0	34.5	79.5	45	17.5	6	55.5	24.5	19
80	42.5	—	51.5	86	46.5	19	9.5	53.5	22.5	23
100	44	—	68	93.5	46.5	19	9.5	53.5	22.5	25
125	49.5	—	86.5	106.5	52.5	25	11	50.5	15.5	23.5

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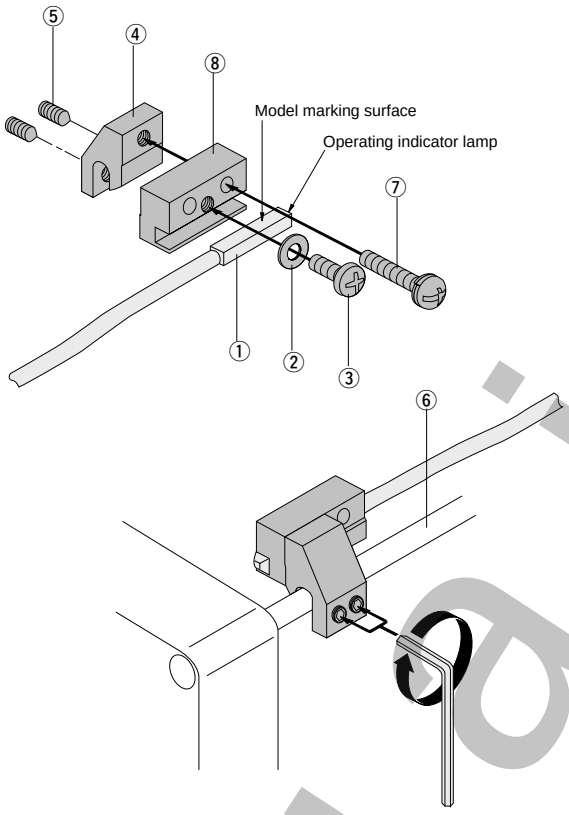
Instructions for Attaching and Removing, and Adjusting of Sensor Switch

ZC1□□, CS□T type

Requirements for mounting one sensor switch on a cylinder

①Sensor Switches
②Washer×1
③Screw (short)×1
④Sensor holder×1
⑤Mounting screw×2
⑥Tie rod
⑦Screw (long)×1
⑧Sub-holder×1



1. ●Align the female thread of sensor holder ④ to the position of the sub-holder ⑧'s thru hole, and use a screw (long) ⑦ to assemble.
●Two thru holes are available for ⑧. Either one can be used.
●The appropriate tightening torque for ⑦ is 70 N·cm {about 7kgf·cm}.

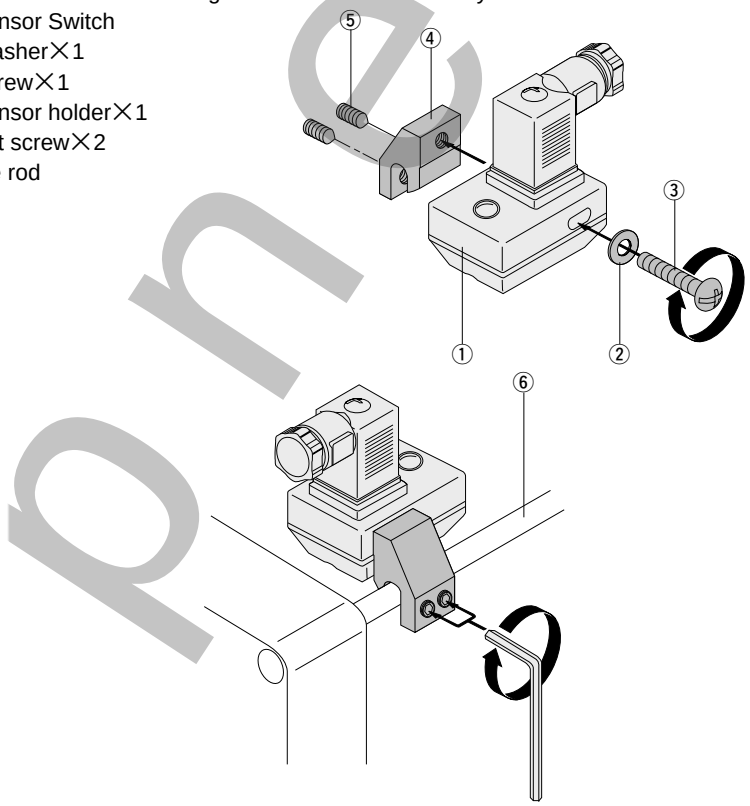
2. ●Install the sensor switch ① with the model marking surfacee facing upward, and fit on the groove ⑧.
●Align the edges of the body ① and indicator lamp (or the cap) to the end plane of ⑧, and assemble. To protect ①, always assemble so that the body ① does not protrude from the end plane of ⑧.
●The appropriate tightening torque for the screw (short) ③ is 70N·cm{about 7kgf·cm}.

3. ●Use two set screws ⑤ to temporarily fix ④ in place.
●Fit ④ that was assembled with ① and ⑧ onto the tie rod ⑥, and align it to the designated position. Then use a hex bar wrench (width across flats B = 2) to tighten ⑤ and fix it in place. Always fix so that the bottom surface of ⑧ is in contact with the cylinder tube.
●The appropriate tightening torque for ⑤ is 70 N·cm {about 7kgf·cm}.
●While the cylinder comes with four pcs. of ⑥, there is no limit to the number of ⑥ that can be used for mounting ④. In addition, ④ can be fitted in any direction.
●Loosening the two ⑤ screws allows ④ to be moved freely along ⑥.

CS□F type

Requirements for mounting one sensor switch on a cylinder

①Sensor Switch
②Washer×1
③Screw×1
④Sensor holder×1
⑤Set screw×2
⑥Tie rod



1. ●For the sensor switch ①, align the female thread of sensor holder ④ to any required location of the ①'s thru hole (oval), and assemble.
●The appropriate tightening torque for the screw ③ is 70N·cm{about 7kgf·cm}.

2. ●Use two set screws ⑤ to temporarily fix ④ in place.
●Fit ④ that was assembled with ① onto the tie rod ⑥, and align it to the designated position. Then use a hex bar wrench (width across flats B = 2) to tighten ⑤ and fix it in place. Always fix so that the bottom surface of ① is in contact with the cylinder tube.
●To detect the head side end of stroke, mount ① so that the connector wiring opening faces toward the head cover side, as shown in the diagram at left.
●The appropriate tightening torque for ⑤ is 70 N·cm {about 7kgf·cm}.
●While the cylinder comes with four pcs. of ⑥, there is no limit to the number of ⑥ that can be used for mounting ④. In addition, ④ can be fitted in any direction.
●Loosening the two ⑤ screws allows ④ to be moved freely along ⑥.

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Mounting Bracket, Knuckles Order Code

●Mounting bracket

□ – □ □

Bore size
32 —— For ϕ32
40 —— For ϕ40
50 —— For ϕ50
63 —— For ϕ63
80 —— For ϕ80
100 —— For ϕ100
125 —— For ϕ125

Cylinder type
NDDA —— **NEW DYNA**
NDDAR — **NEW DYNA** cylinder with brake

Mounting bracket
1 —— Foot mounting type (one set of two units)
2 —— Axis right angled foot mounting type (one set of two units)
3 —— Rod side flange mounting type
5 —— Head side flange mounting type
7 —— Clevis mounting type (with pin)
7-7C — Clevis mounting type (with supporting brackets)
8 —— Pivot mounting type
11 —— Trunnion type
11-11T — Trunnion type (with supporting bracket)

●Y, I type knuckle

□ – □ □

Bore size
32 —— For ϕ32
40 —— For ϕ40
50 —— For ϕ50
63 —— For ϕ63
80 —— For ϕ80
100 —— For ϕ100
125 —— For ϕ125

Cylinder type
NDDA —— **NEW DYNA**
NDDAL — **NEW DYNA** non-rotating cylinder

Knuckles
Y —— Y type knuckle
I —— I type knuckle

●For knuckle dimensions, see p. 105.

Maximum Potential Manufacturing Stroke with Bellows Specification

mm

Bellow model / Bore size	ϕ32～ϕ63	ϕ80～ϕ125
JT	Maximum manufacturable St×3／4—50	Maximum manufacturable St×4／5—50
JC	Maximum manufacturable St×3／4—50	Maximum manufacturable St×4／5—50
JK	Maximum manufacturable St×2／3—50	Maximum manufacturable St×2／3—50
JA	Maximum manufacturable St×2／3—50	Maximum manufacturable St×2／3—50

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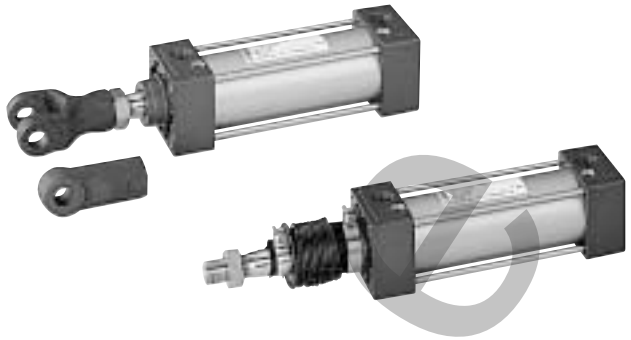
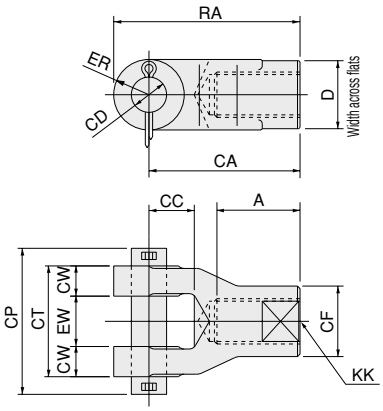
Knuckles, Bellows



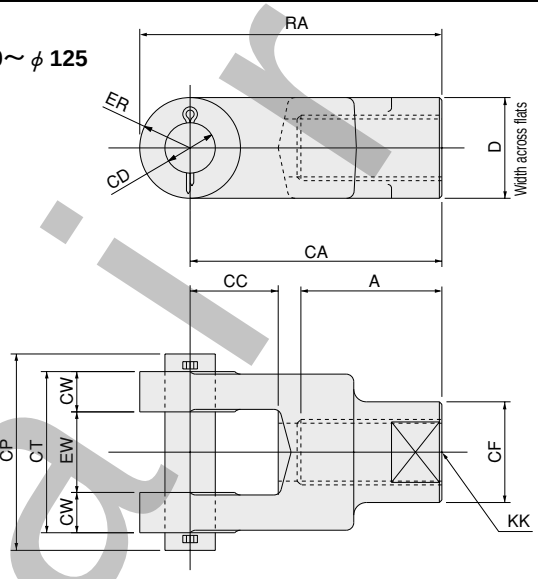
Dimensions of Knuckle (Unit mm)

●Y type

ϕ 32



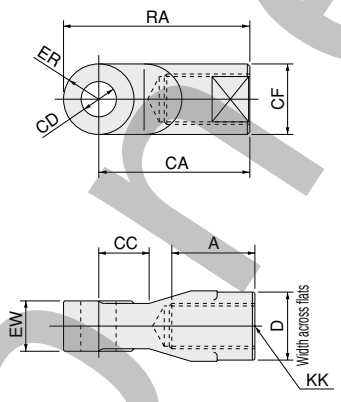
ϕ 40～ ϕ 125



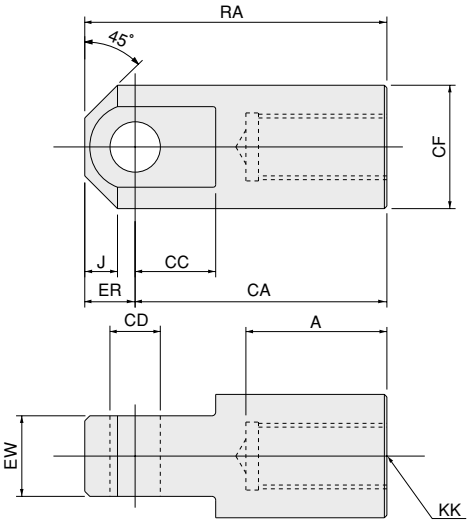
Bore size \ Code	A	CA	CC	CD	CF	CP	CT	CW	D	ER	EW	KK(other than non-rotating)	KK(non-rotating)	RA
32	23	55	20	ϕ12H9/f8	ϕ24	46	32	8	24	R12	16 $^{+1.5}_{+0.5}$	M10×1.25	—	67
40	18	46	16	ϕ12H9/f8	ϕ25	48	36	9	—	R12.5	18 $^{+0.4}_{+0.1}$	M14×1.5	M12×1.25	58.5
50	22	46	16	ϕ12H9/f8	ϕ25	48	36	9	—	R12.5	18 $^{+0.4}_{+0.1}$	M18×1.5	M18×1.5	58.5
63	22	50	20	ϕ16H9/f8	ϕ32	56	44	11	—	R16	22 $^{+0.4}_{+0.1}$	M18×1.5	M18×1.5	66
80	30	75	25	ϕ20H9/f8	ϕ40	68	56	14	—	R20	28 $^{+0.4}_{+0.1}$	M22×1.5	M22×1.5	95
100(other than non-rotating)	34	75	25	ϕ20H9/f8	ϕ40	68	56	14	—	R20	28 $^{+0.4}_{+0.1}$	M26×1.5	—	95
100(non-rotating)	34	75	25	ϕ20H9/f8	ϕ40	68	56	14	—	R20	28 $^{+0.4}_{+0.1}$	—	M22×1.5	95
125	56	100	35	ϕ20H9/f8	ϕ40	78	64	16	40	R20	32 $^{+1.5}_{+0.5}$	M27×2	—	120

● I type

ϕ 32～ ϕ 100



ϕ 125



Bore size \ Code	A	CA	CC	CD	CF	D	ER	EW	J	KK(other than non-rotating)	KK(non-rotating)	RA
32	23	55	20	ϕ12H9	ϕ24	24	R12	16 $^{0}_{-0.1}$	—	M10×1.25	—	67
40	18	46	16	ϕ12H9	ϕ25	—	R12.5	18 $^{-0.1}_{-0.4}$	—	M14×1.5	M12×1.25	58.5
50	22	46	16	ϕ12H9	ϕ25	—	R12.5	18 $^{-0.1}_{-0.4}$	—	M18×1.5	M18×1.5	58.5
63	22	50	20	ϕ16H9	ϕ32	—	R16	22 $^{-0.1}_{-0.4}$	—	M18×1.5	M18×1.5	66
80	30	75	25	ϕ20H9	ϕ40	—	R20	28 $^{-0.1}_{-0.4}$	—	M22×1.5	M22×1.5	95
100(other than non-rotating)	34	75	25	ϕ20H9	ϕ40	—	R20	28 $^{-0.1}_{-0.4}$	—	M26×1.5	—	95
100(non-rotating)	34	75	25	ϕ20H9	ϕ40	—	R20	28 $^{-0.1}_{-0.4}$	—	—	M22×1.5	95
125	56	100	32	ϕ20H9	ϕ49	—	20	32 $^{0}_{-0.1}$	13	M27×2	—	120

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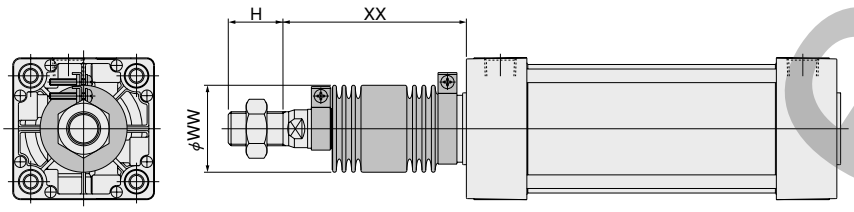
Dimensions of Bellows (Unit mm)



Code / Bore sizer	WW				XX				H
	Nylon tarpaulin	Chloroprene	Cornex	Arumix	Nylon tarpaulin	Chloroprene	Cornex	Arumix	
32	36	36	61	36	1/3 stroke＋48	1/3 stroke＋48	1/2 stroke＋48	1/2 stroke＋48	19
40	41	41	61	41					21
50	47	47	61	47	1/3 stroke＋53	1/3 stroke＋53	1/2 stroke＋53	1/2 stroke＋53	29
63	47	47	61	47					29
80	56	56	61	56	1/4 stroke＋58	1/4 stroke＋58	2/5 stroke＋58	2/5 stroke＋58	37
100	61	61	61	61					37
125	71	71	71	71	1/4 stroke＋59	1/4 stroke＋59	2/5 stroke＋59	2/5 stroke＋59	50

●Bellow Specifications

Type / Specifications	Contents	Proof tempature ˚C
Nylon tarpaulin (standard)	Coating vinyle to nylon cloth	80
Chloroprene	Coating chloroprene to nylon cloth	100
Cornex	Coating silicon to cornex cloth (no use of asbestos)	200
Arumix	Coating arumix to asbestos cloth	250

Note: The temperature shown is the bellows own durable temperature, and is not a temperature for cylinder use.

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